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ANNOUNCEMENTS FOR 1877.

January	9.	University Exercises resumed after Holiday Vacation.
February	12.	*Semi-Annual Examinations begin.*
February	16.	*First Semester closes.*
February	19.	*Second Semester begins.*
March	12.	Juniors (Cl. and L. and Sc. Courses) resume Latin.
March	27.	(Evening.) Recess of one week begins.
March	28.	THE PROFESSIONAL SCHOOLS CLOSE. COMMENCEMENT.
April	9.	Sophomores (Cl. and L. and Sc. Courses) begin History (elected).
April	9.	Sophomores (L. and Sc. Course) begin Geometrical Drawing (elected).
April	16.	Juniors (Cl. Course) resume French.
April	23.	MIDDLE OF THE SEMESTER.
April	23.	Sophomores (Sc. Course) resume History.
April	23.	Sophomores (Sc. Course) begin free-hand Drawing.
April	23.	Sophomores (L. and Sc. Course) begin Descriptive Geometry.
May	7.	Sophomores (Eng. Courses) begin Descriptive Astronomy.
May	26.	Juniors (Eng. Courses) begin Field Work.
May	29–30.	Examination of Seniors.
June	20–22	*Semi-Annual Examination.*
June	23–25.	*Examination of Candidates for Admission.*
June	24.	*Baccalaureate Address.*
June	26.	*Anniversary of the Society of Alumni.*
June	26.	Class-Day.
June	27.	COMMENCEMENT. Summer Vacation begins.

Sept.	20–25.	*Examination of Candidates for Admission.*
Sept.	26.	FIRST SEMESTER BEGINS.
October	1.	PROFESSIONAL SCHOOLS OPEN.
November	7.	Juniors (Cl. Course) resume Greek.
November	26.	MIDDLE OF SEMESTER.
November	26.	Sophomores (Sc. Course) begin History.
November	26.	Freshmen (Sc. and Eng. Courses) begin Geometrical Drawing.
November	—.	Thanksgiving Recess of three days, beginning Tuesday evening.
December	17.	Juniors (Sc. and L. and Sc. Courses) resume History.
December	21.	(Evening.) Holiday Vacation of Professional Schools begins.
December	21.	(Evening.) Holiday Vacation of the Literary Department begins.
1878.		
January	8.	Exercises of the Literary Department resumed.
January	8.	Exercises of the Professional Schools resumed.
February	15.	FIRST SEMESTER CLOSES.

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UNIVERSITY OF MICHIGAN.

THE UNIVERSITY AND THE STATE.

THE University of Michigan is a part of the public educational system of the State. The Constitution of the State provides for the perpetuation of the governing body of the Institution, the Board of Regents. They are elected for terms of eight years by popular vote. In accordance with the law of the State the University aims to complete and crown the work which is begun in the public schools, by furnishing ample facilities for liberal education in Literature, Science, and the Arts, and for thorough professional study of Medicine, Law, and Dentistry. Through the aid which has been received from the United States and from the State it is enabled to offer its privileges without charge of tuition, to all persons of either sex, who are qualified for admission. Its relation to the public schools of the State has now become even closer and more vital than formerly, since under certain conditions the graduates of High Schools are received into the University without examination. While Michigan has endowed her University primarily for the higher education of her own sons and daughters, it must be understood that she also opens the doors of the Institution to all students, wherever their homes. Students from other States are asked to pay a larger admission fee than students from Michigan, but they receive their instruction and access to all the advantages of life at the University, without incurring any charge for tuition. It is in this broad, generous, and hospitable spirit that the University has been founded, and that it endeavors to do its work.

ORGANIZATION OF THE UNIVERSITY.

The University comprises the Department of Literature, Science, and the Arts (including the School of Mines), the Department of Medicine and Surgery, the Department of Law, the School of Pharmacy, the Homœopathic Medical College and the Dental College. Each of these Departments and Colleges has its Faculty of Instruction, who are charged with the special management of it. The University Senate is composed of all the Faculties, and considers questions of common interest and importance to them all.

The Department of Literature, Science and the Arts, has seven regular and full courses of four years each, namely, the Classical, the Scientific, the Latin and Scientific, the Greek and Scientific, the course in Civil Engineering, the course in Mining Engineering, and the course in Architecture and Design. Post-Graduate courses are provided for the graduates of this University, or for the graduates of any College or University, who may desire to pursue advanced study whether for a second degree or not. Students, who do not wish to pursue any one of the above courses may, if they are prepared to enter the University, pursue selected studies for such time, not less than one semester, as they may choose.

The School of Pharmacy is now established as a distinct School and has a regular course of two years.

In the Department of Medicine and Surgery, the Department of Law, the Homœopathic Medical College and the Dental College the instruction is given largely by lectures. The lecture course begins on the first of October and continues to the end of March.

Students in any Department of the University may enter the classes in any other, upon obtaining permission from the Faculties of the respective Departments.

THE LIBRARIES.

The University Library contains about 23,500 volumes, and over 7,000 pamphlets. In 1871 it was enlarged by the addition of the library of the late Prof. RAU, the distinguished Professor of Political Economy in the University of Heidelberg, Germany. The Rau Library was purchased by and presented to the University by PHILO PARSONS, Esq., of Detroit. It contains about 4,000 volumes, and over 5,000 pamphlets. It is especially rich in European works on the Science of Government, Statistics, Political Economy, and cognate subjects. An appropriation of about two thousand dollars is annually made for the enlargement of the University Library.

A Catalogue of the Library has been completed. It consists of two parts, a catalogue of titles on slips, arranged in the Alphabetical order of the names of the authors, and a catalogue of the subjects treated in all the books and reviews and magazines in the Library. This catalogue is accessible to all persons who use the Library.

Eighty-eight American and European periodicals are taken by the Library, and fifty-four magazines and newspapers, representing nearly every part of the country, are kept upon the tables of the Library by the Students' Lecture Association.

The Library is open every week day from 9 o'clock A. M. to 5 P. M., and from 7 P. M to 9½ P. M.

The Medical Library, containing about sixteen hundred volumes, is in the room of the General Library. Twenty-four Medical Journals are regularly received.

The Law Library, kept in the second story of the Law Building, is open to the students of the Law Department, ten hours daily. It contains about three thousand five hundred volumes.

The two Literary Societies, in the Department of Literature, Science and the Arts, have also good libraries.

The Christian Association connected with the University has a well selected Library of moral and religious works. Donations to this Library would be gladly received.

The Libraries accessible to the students amount, in the aggregate, to about 32,000 volumes.

THE ASTRONOMICAL OBSERVATORY.

The Observatory is a donation from citizens of Detroit. The building consists of a main part, with a movable dome and two wings, one of which contains the rooms of the observer, while in the other is mounted the splendid Meridian-Circle presented by H. N. WALKER, Esq., of Detroit. This instrument, one of the largest and best of the kind, and complete in every respect, was imported from Berlin. The same room contains a sidereal clock, made by TIEDE, in Berlin, and two collimators, north and south from the Meridian-Circle, for the determination of the error of collimation. The west wing contains a Chronograph, with BOND's new isodynamic escapement, for recording observations by the electro magnetic method. In the dome is mounted a large refracting telescope, with an object glass thirteen inches in diameter, constructed by the late HENRY FITZ, of New York.

Students who make astronomy an optional study during the Senior year, or in the University Course, will have instruction in the use of the instruments, and will have an opportunity to participate in the observations.

THE MUSEUM.

The collections in the University Museum are illustrative of Natural Science, Ethnology, Art, History, Agriculture, Anatomy and Materia Medica, and are constantly increasing. During the past year numerous and important additions have been made in the departments of Geology, Zoölogy, Botany and Archæology. Prof. HARRINGTON, while connected with the United States expedition to the Aleutian Islands, secured important ethnological and other additions to the Museum. Prof. J. B. STEERE, on his recent return from a five years' journey in South America, Formosa and the East Indies, brought very large and important collections for us. The following description will indicate the character of the collections now in the Museum:

I.—NATURAL HISTORY.

I. A choice collection of MINERALS, embracing over six thousand specimens, principally European. This collection was purchased of the late Baron LEDERER, and is called the "*Lederer Collection.*" Also a rich collection of the MINERAL SPECIES OF MICHIGAN, including all the varieties of Copper Ore and Associated Minerals from the different localities of the Lake Superior district. This collection is partly the fruit of the State Geological Survey, and partly the result of subsequent labors of Prof. DOUGLAS.

II. The collection in GEOLOGY, consisting of:

1. The large and complete series of lithological and palæontological specimens brought together by the State Geological Surveys, of which over a hundred fossil species have already become the types of original descriptions.

2. The WHITE COLLECTION, consisting of 1,018 distinct entries and 6,000 specimens.

3. The ROMINGER COLLECTION, embracing about 2,500 entries and 6,000 specimens, mostly from the Mesozoic formations of Central Europe. This collection embraces 500 specimens of Mesozoic Ammonites.

4. SMITHSONIAN DEPOSITS, consisting for the present of a collection of foreign and domestic specimens of building stones, and 23 specimens of fossils from the Upper Missouri.

5. MISCELLANEOUS DONATIONS AND COLLECTIONS, embracing more than four cases illustrating the metalliferous regions of the Upper Peninsula, collected by Prof. WINCHELL.

An interesting collection of fossils, chiefly cretaceous, from the Yellowstone Valley, presented by the late General CUSTER, U. S. A.

The entire Geological Cabinet is estimated to contain about 14,000 distinct entries and 41,000 specimens.

III. A very large ZOÖLOGICAL COLLECTION, consisting of:

1. A complete suit of the Birds which visit Michigan, with most of the Mammals of the State; a nearly complete series of the Reptiles found east of the Rocky Mountains; two thousand species of Mollusca, embracing all the land and fresh-water forms of the Northern and Western States, and a considerable collection of the Fishes and Radiata.

2. The TROWBRIDGE COLLECTION. This is a series of 1,856 entries (3,000 specimens), in most of the classes of the Animal Kingdom, made by Lieut. TROWBRIDGE, (formerly Professor in the University), upon the Pacific coast, with numerous additions from the interior and eastern portions of the continent, supplied by the Smithsonian Institution.

3. A collection of about 5,000 Coleoptera and Lepidoptera from the estate of the late GEORGE L. AMES, M. D., of Niles.

4. SMITHSONIAN DEPOSITS, consisting of about 200 skins of birds from the Arctic Zone; 204 entries of marine shells from the Indo-Pacific, and Panama, labeled by Mr. P. P. CARPENTER; 81 entries of Unionidæ; 250 entries of miscellaneous shells; in all, 535 entries of fresh-water and marine shells.

5. The STEERE ZOÖLOGICAL COLLECTION, comprising about 25,000 insects, 1,500 shells, 8,000 birds, and numerous representatives of other groups; total, about 10,000 entries and 60,000 specimens.

6. A collection of specimens illustrating Comparative Anatomy. This collection contains several perfect, typical skeletons, and comprises 250 species, 1,000 specimens.

7. Miscellaneous Collections and Donations. The whole number of entries in the Zoölogical Cabinet is about 23,250, and the whole number of specimens over 110,000.

IV. A Botanical Collection, consisting of:

1. The plants of the State, collected by the public surveys, and numbering about 1,175 species, 1,500 entries, and 9,000 specimens.

2. The Houghton Herbarium, collected by the late Professor Douglas Houghton, M. D., and presented to the University by his widow, the late Mrs. R. R. Richards. It consists of 28 folio cases of dried and labeled plants from various parts of the United States, and is estimated to contain 1,800 species.

3. The Sager Herbarium, presented by Prof. Abram Sager, and containing about 1,200 species and 5,000 specimens, collected mostly in the New England and Western States.

4. The Dr. Ames Herbarium, consisting of a serial collection of 7,000 specimens, and 10,500 duplicates, presented by the family of the late Dr. Ames, of Niles, Michigan.

5. A collection of Alaskan plants, presented by Capt. W. H. Dall, of the U. S. Coast Survey.

6. A collection of 2,000 species of plants, presented by Prof. M. W. Harrington.

7. A collection of 225 species of mosses from Central Europe, presented by Prof. Paul Reinsch, Erlangen, Bavaria.

8. A collection of 408 species, over 800 specimens, of Algæ, from Mr. Horace Averill.

9. The Steere Botanical Collection, which comprises 500 species, 2,500 specimens, mostly ferns.

10. The Adams Jewett Collection, consisting of 2,500 species, 5,000 specimens. This collection was a part of the estate of Adams Jewett, M. D., of Dayton, Ohio, and was presented by his heirs, through H. S. Jewett, M. D. (1868), his son.

11. The Lemmon Collection of 460 species of California plants; presented by J. G. Lemmon.

12. A collection of 300 species from the AGRICULTURAL DEPARTMENT at Washington.

13. A collection of 3,000 German plants from S. S. GARRIGUES, State Salt Inspector, Saginaw.

14. A collection of truncheons of different varieties of woods from the United States, South America, China, and other countries.

15. A collection of the seeds of native and cultivated plants.

The whole Botanical Cabinet contains 10,000 species, 20,000 entries, and 70,000 specimens. The Geological, Zoölogical and Botanical Cabinets together, are estimated to contain 60,000 separate entries and 255,000 specimens.

II.—ARCHÆOLOGY AND RELICS.

This department of the Museum contains various articles of domestic and warlike use among the North American Indians, and the Islanders of the South Pacific; numerous remains of the ancient Peruvians; many specimens of clothing, art, etc., of the Amazonian Indians, Modern Peruvians, Chinese, Formosans, and natives of the East Indies and Alaska; and sundry relics and memorials of the enterprises of Peace, as well as of our great Civil War. It seems eminently appropriate that the University of Michigan should make efforts to preserve memorials of the native tribes, so fast disappearing before the march of civilization; and it is earnestly hoped that this department of the Museum may be deemed a suitable place of deposit for any such relics in the possession of our citizens. A number of interesting relics from the Pacific Islands have been added by the Smithsonian Institution.

Efforts are making to found in the University a collection illustrating the materials, processes and products of agriculture and horticulture. The nucleus of such a collection already exist in—1st, The Botanical and Zoölogical Cabinets, and the Cabinets of Economical Geology; 2d, A collection of the seeds of cereals and other field and garden crops; 3d, An interesting collection of textile fibres and various substitutes for cotton, received from the Department of Agriculture at Washington.

III.—THE FINE ARTS AND HISTORY.

This collection was commenced in the year 1855, and at present comprises:

1. A Gallery of Casts, in full size and in reduction, of the most valuable Ancient Statues and Busts. These were mainly executed at the imperial modeling establishment of the Louvre, by Desachy, of Paris, and by the Brothers Micheli, of Berlin.

2. A Gallery of more than two hundred Reductions and Models in terra cotta and other materials. These represent Statues, Portrait Busts, Vases, and other Antiquities in the Museo Borbonico and other European Museums. They were executed at Naples.

3. A Gallery of Engravings and Photographic Views, executed in Italy and Greece, illustrating especially the Architectural and Sculptural Remains of Ancient Rome, Pompeii, Paestum, Athens and Corinth.

4. The HORACE WHITE COLLECTION OF HISTORICAL MEDALLIONS, comprising, first, four hundred and fifty Casts from Antique Gems in the Royal Museum at Berlin, illustrative of Ancient History; second, over five hundred Casts illustrative of Mediæval History and of the Renaissance Period; third, about four hundred Medallion Portraits of Leading Personages in Modern History.

5. A collection has been commenced of engraved copies of the great masterpieces of modern painting, beginning with those prior to Raphael.

6. The Statue of Nydia, and of Ruth Gleaning, by Randolph Rogers.

In addition to the above are several copies of Modern Statues, Busts, and Reliefs, by Michael Angelo, Canova, Thorwaldsen, and others, the most valuable of which are copies in bronze of the Moses, and of the Augustino and Julian di Medici of Michael Angelo.

A new Catalogue of this Museum has just been prepared with great care by Prof. FRIEZE.

IV.—ANATOMY AND MATERIA MEDICA.

The University has become the owner of the valuable Anatomical Museum, formerly the property of Prof. FORD, the results of his labor for many years in the preparation and purchase of materials for the direct purpose of most successful teaching.

It embraces a valuable collection of bones, amply illustrating healthy as well as diseased conditions, likewise the various changes from infancy to old age.

It contains numerous skulls, teeth and other preparations of great interest and value, by which, not only the structure, but also the various stages in the development of both temporary and permanent teeth are well illustrated; as well as many valuable exhibitions of diseases of the teeth and associated parts, furnishing the Dental student important aid in the prosecution of his studies.

The Arterial Preparations are numerous, embracing complete and partial dissections, well preserved, exhibiting the normal as well as many abnormal arrangements of vessels, and furnishing ample facilities for studying the vascular system.

There are also Models in Wax, Papier Maché, and Plaster, of various parts of the body which they serve best to illustrate; and the Museum is rich in whatever can best advance the interests of the student.

The valuable collection of Prof. SAGER, illustrating the comparative craniology, neurology and embryology of the Vertebrata, and also the pathology and anatomy of the Diseases of Women, has been added to the property of the University, and to it accessions are annually made.

The department of the Museum illustrative of Materia Medica consists of a very complete suit of crude Organic Medicinal Substances, embracing between five and six hundred specimens, imported from Paris, put up in beautiful glass-covered half-gallon jars, of uniform appearance, finely displayed, and arranged according to their order in Natural History; besides about one thousand other specimens of Simple Mineral and Vegetable Substances, and Pharmaceutical and Officinal Preparations, Active Principles, etc., arranged in groups convenient for study.

Besides these actual specimens, Medical Botany is illustrated by between one hundred and two hundred large and finely-colored Plates, framed and glazed and displayed for observation.

All the above collections are arranged in galleries, for the purpose of rendering them accessible both to students and visitors. The University thus affords a secure depository for objects of value and curiosity, and it is, therefore, to be hoped that the Museum will receive accessions by donations from various sources.

DEGREES AND POST-GRADUATE COURSES.

The Degree of MINING ENGINEER is conferred upon students who complete the course and pass the examinations in the School of Mines.

The Degree of CIVIL ENGINEER is conferred upon students who complete the course of Civil Engineering, and pass the examinations in the same.

The Degree of PHARMACEUTICAL CHEMIST is conferred upon students who complete the course and pass the examinations in the School of Pharmacy.

The Degree of BACHELOR OF ARTS is conferred upon students who complete the Classical Course, and pass the examinations in the same.

The Degree of BACHELOR OF PHILOSOPHY is conferred upon the students who complete the Latin and Scientific Course, or the Greek and Scientific Course, and pass the examinations in the same.

The Degree of BACHELOR OF SCIENCE is conferred upon students who complete the Scientific Course, and pass the examinations in the same.

The Degrees of DOCTOR OF MEDICINE, BACHELOR OF LAWS and DOCTOR OF DENTAL SURGERY are conferred upon conditions which are given hereafter in the chapters descriptive of the Professional Schools.

The Degrees of MASTER OF ARTS, MASTER OF PHILOSOPHY, and MASTER OF SCIENCE will until Commencement, 1877, be conferred respectively upon Bachelors of Arts, Bachelors of Philosophy, and Bachelors of Science of three years' standing, who are graduates of this University. *But after* 1877 *these Degrees will not be conferred "in course"*.

The Degrees of MASTER OF ARTS, MASTER OF PHILOSOPHY, and MASTER OF SCIENCE are conferred respectively upon Bachelors of Arts, Bachelors of Philosophy, and Bachelors of Science, upon examination, according to the following conditions:

I. (1.) The candidate must be a graduate either of this or of some other collegiate institution empowered to confer degrees.

(2.) He must pursue, at least for a year, two of the courses of post-graduate studies designated in the programme on the following pages.

(3.) He must sustain an examination before the Faculty in at least three of the studies so attended—the studies to be elected by the candidate.

(4.) He must present a thesis to the Faculty on one of the subjects chosen for examination.

The second Degree may thus be obtained, on examination, one year after the first Degree.

The higher courses will not be restricted to graduates and candidates for the second degrees, but will be open to all who shall give satisfactory evidence of ability to profit by them.

II. These Degrees may be conferred respectively on BACHELORS OF ARTS, BACHELORS OF PHILOSOPHY, and BACHELORS OF SCIENCE, graduates of this University, who have not resided here since graduation, but who at a date not earlier than two years after graduation shall, on examination, show special proficiency in literary or scientific studies, and shall present a satisfactory thesis to the Faculty.

III. The Degree of DOCTOR OF PHILOSOPHY is open to the graduates of this University, or of any other reputable university or college, who shall have satisfied the Faculty on examination that they have made special proficiency in some one branch of study, and good attainments in two other branches to be specified by the Faculty. They will be expected to reside here, and to perform an amount of work which will occupy at least two years.

Persons, who are not graduates, will be received as candidates for this Degree, if they satisfy the Faculty that they have made attainments equivalent to those required here for the Degree of Bachelor of Arts, or Bachelor of Philosophy, or Bachelor of Science.

PROGRAMME OF STUDIES

FOR THE DEGREES OF M. A., M. P., AND M. S.

COURSES FOR THE FIRST SEMESTER.

Professor DOUGLAS.—*Chemistry and Mineralogy.*—A course of Qualitative Analysis, and of Blow-pipe Analysis of Minerals.

Professor FRIEZE.—*Latin Literature.*—The Roman Satirists.

Professor ADAMS.—*History.*—The Growth of Liberty in England.

Professor WATSON.—*Astronomy.*—Numerical Calculus; Theory of Interpolation and Quadratures; Method of the Least Squares.

Professor OLNEY.—*Mathematics.*—Differential and Integral Calculus.

Professor D'OOGE.—*Greek Language.*—History of Classical Philology.

Professor COCKER.—*Logic.*—Its History and Actual Influence on Thought and Language.

Professor MORRIS.—*French Literature.*

Professor GREENE.—*Civil Engineering.*—Theory of Constructions.

Professor PETTEE.—*Mineralogy and Lithology.*—A course of Determinative Mineralogy and Lithology.

Professor LANGLEY.—*Physics.*—Physical Manipulation.

COURSES FOR THE SECOND SEMESTER.

Professor DOUGLAS.—*Chemistry and Mineralogy.*—Course of Quantitative Analysis, with investigations, referring especially to the application of the Science to the Arts, Manufactures, and Agriculture.

Professor FRIEZE.—*Latin Literature.*—The Philosophical Writings of Cicero, and the Works of Seneca.

Professor ADAMS.—*Constitutional History of the United States.*

Professor WATSON.—*Calculations* of the special and general Perturbations of Planets and Perturbations of Comets.

Professor OLNEY.—*Mathematics.*—Calculus of Variations.

Professor D'OOGE.—*Greek Literature.*—The Greek Lyric Poets.

Professor COCKER.—*General Culture.*—Theory of Taste; History of Philosophy.

Professor MORRIS.—*German Literature.*

Professor GREENE.—*Civil Engineering.*—Theory of Machines; Hydraulics.

Professor LANGLEY.—*Physics.*—The Mathematical Theory of Light and Sound.

EXPENSES.

The only charges made by the University are: To residents in Michigan, an admission fee of ten dollars, and the annual payment of fifteen dollars; to those who come from other States or countries, an admission fee of twenty-five dollars, and the annual payment of twenty dollars. A by-law of the Board of Regents provides as follows:

Every student before entering any department of the University, shall pay to the Steward the sum of ten dollars if a resident of Michigan, and the sum of twenty-five dollars if from any other State or country, as a matriculation fee. Each student shall also pay to the Steward annually fifteen dollars if a resident of Michigan and twenty dollars if a resident of any other State or country, to be devoted to the payment of incidental expenses. Resident graduates are required to pay the same annual dues as undergraduates, and no student or graduate shall be allowed to enjoy the privileges of the University except on presentation to the President of the Steward's receipt for all fees and dues specified in this or any other rule or regulation of the Board of Regents.

The name of no person shall be presented by any Faculty to the Board of Regents for a degree, till he has exhibited to the Faculty the receipt of the Steward for the payment of all his dues, including the fee for diploma.

The admission fee is paid but once, and entitles the student to the privileges of permanent membership in any department of the University. The annual tax is paid the first year and every year thereafter.

There are no dormitories and no commons connected with the University. Students obtain board and lodging in private families for from three to five dollars per week. Clubs are also formed, in which the cost of board is from one dollar and a half to two dollars and a half per week.

It is proper to say, in answer to numerous inquiries, that the University does not undertake to furnish manual labor to students. Yet a considerable number of the students find in the city opportunities for remunerative labor.

Room rent varies from seventy-five cents to two dollars a week for each student.

The annual expenses of students in the Academic Department for the last few years, *including clothing and incidentals*, have been on the average, about $370. The expenses of Professional students are from $150 to $200 per term of six months.

BY-LAWS CONCERNING ADMISSION.

1. To the Academic Department. Every candidate for admission, when coming from another Collegiate Institution, shall exhibit a certificate of honorable dismission.

Every candidate for admission to the Freshman Class shall pass an examination satisfactory to the Faculty, in the preparatory studies as required by the rules; and every applicant for an advanced standing shall be examined not only in the preparatory course, but also in all the previous studies of the class which he proposes to enter.

No student can be admitted to the department whose age is less than sixteen years.

2. To the Law Department. No student shall be admitted to this department who has not attained the age of eighteen years, nor until he has presented to the Faculty evidence of a good moral character.

3. To the Medical Department. Every candidate for admission shall exhibit to the Faculty satisfactory evidence of a good moral character, and of a good preparatory English Education.

4. To the Homœopathic Medical College. The same requirements as in (3).

5. To the Dental College. The same requirements as in (3).

6. To the School of Pharmacy. The same requirements as in (3), and further such knowledge of General Chemistry as the Faculty shall require.

RELATIONS OF STUDENTS TO THE CITY GOVERNMENT.

Students are temporary residents of the city, and, like all other residents, are amenable to the laws. Whenever guilty of disorder or crime, they are liable to arrest, fine, and imprisonment, and can claim no peculiar exemption from public disgrace and legal penalties.

DEGREES CONFERRED

DURING THE YEAR.

PHARMACEUTICAL CHEMIST.

Samuel E. Allen,
Joseph Henry Ames,
Lyman F. Beach,
Francis Thomas Bower,
James Neelands Buckham,
Charles Silvers Burroughs,
Orrin Sandsford Churchill,
John Thaddeus Clark,
Jeremiah Coughlin,
Charles Wallace L. Dietrich,
Charles Austin Dingley,
Charles Hulbert Eddy,
Louis C. Fuller,
Morris Udeen Green,
Charles Grimwood,
George Gundrum,
William John Holloway,
Henry Fennell James,
John Robbins Little,
James Lynn,
Frank W. Herbert Massey,
James William Morgan,
Henry Betts Parsons,
Joseph John Pierron,
Edward Judson Risser,
Herman Merton Roys, B. S.,
William Clarence Sheffield,
Stewart Whedon Smith, B. A.,
Thomas Martin Stewart,
Catharine M. Watson,
Walter John Whitlark.

CIVIL ENGINEER.

Dewitt Clinton Allen,
James Oscar Caldwell,
Frank P. Davis, M. S.,
Lewis Cass Donaldson,
Charles Alfred Marshall,
Joseph Ripley,
John Dana Sanders,
John Martin Schaeberle,
Jonathan C. Shepard,
Lester Herbert Strawn,
Alonzo J. Tullock.

BACHELOR OF SCIENCE.

Ida M. Bellis,
Ben Taylor Cable,
Burton Byron Campbell,
George Clithero,
James Hoyt McFarlan,
Josiah Benjamin Newton,
Albert Chesterfield Pearson,
Louisa Maria Reed,

Charles Connor,
Edward Donovan,
John Charles Floyd,
William Jay Warner,
James Anderson Watterson,
Charles William Wooldridge.

BACHELOR OF PHILOSOPHY.

Philip Riley Boone,
Henry Munroe Campbell,
Willis G. Campbell,
Annie Warden Ekin,
Helen Marie Farrand,
Fred Lee Forman,
Vine Colby Foster,
Edward Alonzo Gott,
Abram Sager Hall,
Henry Sheldon Harris,
Gertrude Helen Mason,
David Adolphus Sawdey,
Edward Cassius Swift.

BACHELOR OF ARTS.

Henry Wilkins Alexander,
Lucy Caroline Andrews,
George Baker,
Edmund Drinan Barry,
Charles A. Blair,
Clarence Shepard Brown,
William Wadsworth Burt,
Albert Melvin Cooper,
Archibald Lamont Daniels,
Anson Peter DeWolf,
William Henry Dopp,
William Pitt Durfee,
Bessie Eaglesfield,
Frank Lawrence Felch,
Alice Elvira Freeman,
Fred Keays Gustin,
Dennie J. Higley,
James Keeler Ilsley,
James Henry McDonald,
Charles W. Howard Potter,
Edward Hitchcock Ranney,
John Henry Reynolds,
Ben Safley,
Lucy Maynard Salmon,
Frank D. Shaver,
Howard Burnham Smith,
Louis Crandall Stanley,
Joseph Hall Steere,
Emma Sophia Stockbridge,
Charles Lee Van Pelt,
Charles B. Van Slyke,
Orlaf Varlo,
Albert Jacob Volland,
Bryant Walker,
Willis Shotwell Walker,
Thomas Rawlins Wilcoxson,
Mary Alice Williams,
Robert Justice Young.

MASTER OF SCIENCE [ON EXAMINATION.]

Caroline Irene Hubbard, B.S.

DOCTOR OF PHILOSOPHY [ON EXAMINATION.]

William Henry Smith, M.A.,
Victor Clarence Vaughan, M.S.

MASTER OF ARTS [IN COURSE.]

George W. Allyn,
Marcus Baker,
Austin Barber,
Levi L. Barbour,
James Knox Blish,
Wilbur Buzzell,
William Matthews Carrier,
Samuel Chapel,
Thomas Chalmers Christy,
Charles Edgar Conley,
Henry W. Fairbank,
Herschel Robert Gass,
Marshall Thomas Gass,
Henry Marsh Haskell,
Loyal Edwin Knappen,
Charles Kellogg Latham,
William H. McKee,
James Herbert Maguire,
Addison Moffat,
Henry Otis Perley,
Sherwood R. Peabody,
George Frank Robison,
Harry Russell,
William James Stuart,
Ernest Taylor Tappey,
Thomas Chalmers Taylor,
Oliver S. Vreeland,
William Brown Williams,
Theodore B. Wilson,
Roland Woodhams.

MASTER OF SCIENCE [IN COURSE.]

Salem Town Chapin,
John Monroe Darnell,
James Du Shane,
Joseph Marvin Lewis,
William Henry Hinman,
Frank Henry Lyman,
James William Yule.

MASTER OF PHILOSOPHY [IN COURSE.]

Samuel T. Douglas,
James Riddle Goffe,
Marshall Key Ross,
Herbert Dwight Peters,
L. Burrie Swift,
Cyrus O. Tower.

DOCTOR OF MEDICINE.

James Anderson,
Elbert Eugene Barnum,
Charles Ephraim Begel,
William Randall Birdsall,
Henry Patrick Birmingham,
Don Alvarado Bisbee,
Albert Broek,
George Alson Brundage,
Josephus Martin Burgess,
Reed Burns,
Alexander X. Campbell,
Joseph Gillespie Millspaugh,
Joseph J. Moore,
Frank Carpenter Moulding,
Byron J. Murray,
George Cydro D. O'Neil,
Thomas P. Oven,
Emory Clark Palmer,
Ezra Augustin Palmer,
George Calder Palmer,
Edward C. Prindle,
Samuel David Radley,

John F. Campbell,
John Oscar Campbell,
Howard Maxwell Casebeer,
Charles Sumner Chamberlin,
H. Dewey Chamberlin,
Clement L. Chandler,
Richard Cosens,
Charles G. Cruickshank,
Clifford L. DeVinney,
Amasa John Dickinson,
Daniel O'Donovan,
Ulrich Duehr,
John Maynard Emery,
Ira Mesick Garrison,
John Georg,
Willoughby Lyman Godfrey,
Daniel Howard Gregory,
Horace William Hammond,
Daniel Scott Hanson,
Henry Bishop Hatch,
John Walker Hauxhurst,
Alonzo Ward Hill,
Charles Carroll Hyde,
Merrill James Hyde,
Michael Hamilton Kerwin,
Robert John Kingston,
Henry Kremers,
Frank Newton Latimer,
John Lee,
John Marvin Lewis,
Robert Logan,
Harmon Y. Longacre,
Charles Edwin Luscomb,
Donald A. C. McDonald,
Peter McGregor,
Duncan McKellar,
William M. E. Mellen,
Cyrus S. Rice,
Perry Schurz,
Reuben Schurz,
John Sanford Seeley,
John Rings Shaffer,
Henry Lane Snodgrass,
Jerome D. Stocking,
Joseph Hume Taylor,
Will Gaylord Terry,
James Albert Thompson,
Richard C. Traver,
John Jacob Travis,
Henry V. Van Velsor,
Daniel James Wallace,
Albert Ernest Weed,
Charles Franklin West,
Homer Harvey White,
Levi O. Williams,
Elisha W. Young,

Mina Annette Baker,
Idris Helen Briggs,
Phoebe Delinda Bullock,
Eliza Maria Ellinwood,
Mary Jane Forsythe,
Leonora A. Howard,
Mabel Beecher King,
Catherine Lindsay,
Caroline Neilsen,
Martha Marcella Norris,
Abby Pease,
Mary Jane Rising,
Sarah Fowler Stockwell,
Millie K. Upjohn,
Sylvia M. Ward.

BACHELOR OF LAWS.

George Sidney Aldrich,
Ernest L. Allen,
Thomas Martin Allen,
Lemuel True Atwood,
Ezra Castle Barnum,
Charles Llewellyn Kennedy,
Lewis Henry Kent,
Moses Pierce Kinkaid,
Johannes Kopelke,
James R. Laing,

Berzelius Laennec Barr,
John Wesley Baxter,
R. Allyn Bill,
James Little Blaine,
Egford Bly,
Charles Blim,
Joel Christopher Booth,
William Thomas Bope,
David Locke Boynton,
Thomas Ira Briscoe,
Cyrus Angell Bryant,
George Henry Buckman,
William Harvey Burchard,
John L. Burleigh,
Charles William Burnham,
Frank Butterfield,
Robert Stuart Campbell,
Alfred George Carpenter,
John H. Chase,
Frank Wilfred Chase,
Thomas Abbott Cheshire,
Dallas M. Clapsaddle,
Aaron Clark,
Gilbert Marsh Cleveland,
Lyman Bates Coe,
Edward Fenton Colborn,
Frank Harvey Colbath,
William Seymour Coman,
William H. H. Cooper,
Washington L. Cooper,
Judson Clement Cornwell,
Powel Crosley,
William Henry Daniels,
Michael Deveraux,
Joseph Leonard Dobbin,
Wilbur Fisk Drury,
James Franklin Duff,
Jacob Piat Dunn, Jr.,
Henry Franklin Dusing,
Martin Luther Easterday,
Addison Joseph Edgerton,
Charles Edward Emanuel,
Franklin Sheldon Foote,
Mary E. Foster,
Louis Hanes Landon,
Harry Richard Lewis,
Nicholas Thompson Lindsay,
Joseph Julius Lloyd,
Fred A. Maynard,
Albert McCall,
A. Marsh McConoughey,
S. Patterson McDivitt,
Michael McHugh,
Frank Edward Mead,
Eneshia Meers,
Charles Mortimer Merrill,
Charles Austin Merriman,
James Gardner Miller,
Samuel Moyer Miller,
John Orlando Moffat,
John Alexander Moninger,
B. Frank Montgomery,
John Elliot Moore,
Rufus Belmont Myers,
Jason Earl Nichols,
John Edward Nolan,
Russell Cowles Ostrander,
Augustus Alfred Parkinson,
Wilbur Russell Pearce,
Livingston Babcock Peaslee,
John Nicholas Perrin,
James Edwin Phillips,
John Albert Phillips,
George Watt Poland,
Edward Wayland Porter,
John Coatsworth Post,
Alfred Bixby Quinton,
John Rufus Ranney,
George Milton Reid,
Leonard C. Reynolds,
James Melville Ricketts,
John F. Rodabaugh,
William Henry Russell,
George Wallace Salmans,
John H. Schneider,
Robert Albert Scott,
Linus Homer Seaver,
Charles Clinton Selfridge,

William Albert Fraser,
Charles Louis Frederick,
William Wallace Fry,
Charles Augustus Golden,
Benjamin Gore,
James Sedgwick Gorman,
Amandus Newton Grant,
George Franklin Griffin,
Lorenzo Dow Haggerty,
Joseph Milton Hance,
James Louis Hannett,
Benjamin Franklin Harness,
George L. Harnsberger,
Ariel Charles Harris,
Samuel Joseph Hays,
Anderson S. Hershey,
Harry Rolland Hill,
Joseph Foreman Hobbs,
Charles Clark Hopkins,
Frank Marion Hubbard,
Fred Arthur Hunt,
Frank Wilsie Ingersoll,
Frank M. Ish,
Albert P. Jacobs,
Frank Sherman Jennings,
Walter Denney Jones,
William Edward Jones,
Milton Fillmore Jordan,
Eugene Merrill Joslin,
Charles Abbott Kebler,
Ronald Kelley,
Oscar M. Seward,
James Fraser Seybolt,
Eugene S. W. Siebert,
Mazzini Slusser,
Dix Wilberforce Smith,
Peter Oman Sproul,
Marion Steele,
Gamaliel Cyrus St. Johns,
Abraham Tausig,
John Martin Taylor,
Jonathan Gibson Taylor,
Charles Edwin Thomas,
Wm. Wallace Thomas,
Wm. Wheeler Thornton,
Frank Albert Ticknor,
Clarence Tinker,
William Harrison Tuller,
Nathan Enoch Utt,
Jerome L. Vanderwerker
Robert Henry Vickers,
Louis Francis Wade,
Charles Baker Wandelohr,
Frank Wellington Waring,
James Willard Watts,
James Amos Willoughby,
Emmet Wakeman Wilson,
Justus Appleton Wilson,
Theodore Winningham,
Edward William Withey,
Arthur Woodcock.

DOCTOR OF DENTAL SURGERY.

Arthur Carlcton Beecher,
George Julian Carter,
Ulrich Duehr.
George Esbon Wright,

DEPARTMENT

OF

LITERATURE, SCIENCE, AND THE ARTS.

REQUIREMENTS FOR ADMISSION.

All candidates for admission to the Freshman Class must be at least sixteen years of age, and must present satisfactory evidence of good moral character.

I.—CLASSICAL COURSE.

Candidates for this course will be examined in the following studies:

1. English Language.—*Grammar.* Hart's Composition and Rhetoric, with special attention to Chapter I., Part I., on Punctuation and Capitals; to Chapter VI., Part I., on Versification; and to Chapters VIII. and IX., Part II., on Proof-Reading, and on the study of the English Language.

2. Geography.—General facts of Physical Geography, the Political Geography of Europe and the United States, and Ancient Geography, particularly that of Italy, Greece, and Asia Minor.

3. History.—In Grecian History, the first *three* books of Smith's History of Greece, exclusive of the chapters on Literature and Art; an outline of Roman History, from the foundation of the city to the battle of Actium; and of the History of the United States, to the close of the Revolutionary War.

4. Mathematics.—*Arithmetic.* Fundamental Rules, Fractions, Common and Decimal, Denominate Numbers, Percentage, Proportion, Involution and Evolution.

Algebra.—Fundamental Rules, Fractions, Simple Equations, Elimination, Involution and Evolution, the Calculus of Radicals, Quadratic Equations, Ratio, Proportion and the Progressions, and an elementary knowledge of Logarithms: *i. e.*, through Olney's Complete School Algebra, or an equivalent in other authors.

Geometry.—Plane, Solid, and Spherical Geometry; *i. e.*, the first two parts of Olney's Geometry, or an equivalent in other authors.

5. LATIN.—*Latin Grammar.*—Harkness's or Allen and Greenough's.

Prose Composition.—Harkness's Introduction to Latin Composition, from page 50 to page 166; or forty-four exercises in Arnold's Latin Prose Composition; or an equal amount in Allen and Greenough's Latin Prose.

Reading.—Four books of Cæsar's Commentaries; Six Select Orations of Cicero, and the whole of the Æneid; or the first six books of the Æneid and an amount either of prose or of poetry equivalent to the last six books.

In reading the last six books of the Æneid, the principal aim should be to acquire facility in translation, and increased knowledge of the Latin vocabulary. It is supposed that the student, already familiar with the style of Virgil, will be able to read this portion of the Æneid more easily and rapidly than an equal amount in any other text-book.

The *Roman Pronunciation of Latin* has been adopted.*

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* ROMAN PRONUNCIATION OF LATIN.—The University has adopted the following system of pronunciation, based upon the investigations of Corssen and other eminent philologists, and now employed in its essential features in the Universities and leading schools of England, and in Harvard, Cornell, and other institutions of this country; as being proved beyond question a close approximation to the Roman pronunciation in the time of Cicero.

VOWELS.

Long.	*Short.*
a as in father.	a as in amend, or in quaff, (not as in hat).
e as in they.	e as in met.
i as in machine.	i as in pity.
o as in go.	o as in police, (not as in cot).
u as oo in in too.	u as in pull (not as in but).
y as i.	

DIPHTHONGS.

In pronouncing the diphthongs the sound of both vowels is preserved.

ae as the word ay.
au as ow in power.
oe as oi in oil.
eu nearly like u in use.
u in ua. ue, &c., like w.
ei as in rein.

CONSONANTS.

c always as in can.
ch as k.
g always as in gun.
j always as y in young.
s always as in sin.
t always as in tin.
v either as Fr. ou in oui, or like Eng. v.

CLASSICAL COURSE.

		CLASSICAL COURSE.	S
FRESHMAN.	1st SEMESTER.	LATIN :—1 .... 1st Div. 10½, 2d Div. 9½. GREEK :—1 .... 2d Div. 10½, 1st Div. 9½. MATH.:—1 .... 2d Div. 8¼, 1st Div. 11½. ENGLISH EXERCISES : † .... Fridays, 4.	GEOM. D DESC. G FRENCH : MATH.:—1 ENGLISH
	2d SEMESTER.	LATIN :—1 .... 1st Div. 10½, 2d Div. 9½. GREEK :—1 .... 2d Div. 10½, 1st Div. 9½. MATH.:—1 less 30 l. 2d Div. 8¼, 1st Div. 11½. BOTANY : —30 l. .... 1st Div. 8, 2d Div. 11½. ENGLISH EXERCISES : .... Fridays, 4.	MATH.:—1 .... FRENCH : ENGLISH BOTANY :— ENGLISH L
SOPHOMORE.	1st SEMESTER.	LATIN :—1-2 .... 4. GREEK :—1-2 .... 8¼. ENGLISH LITERATURE :—1-2 .... 3. RHETORIC :—1-2 .... 3. MATH.:—1 .... 1st Div. 10½, 2d Div. 11½. ESSAYS : † .... Mondays and Tuesdays, 2.	HISTORY :—1 ... FRENCH :—1 ... MATH.:—1 .... ESSAYS : ...edn
	2d SEMESTER.	LATIN :—1 .... 1st Div. 9½, 2d Div. 10½. GREEK :—1 .... 2d Div. 9½, 1st Div. 10½. MATH.:—6 w .... 1st Div. 8, 2d Div. 2. MATH. or HISTORY :—1 less 6 w .... 3. ESSAYS : .... Mondays and Tuesdays, 2.	MATH.:—1-2 .... FREE-HAND DRA or PERSPECTIVE :— ENGLISH LIT.:—1-2 RHETORIC :—1-2 ... FRENCH :—1-2 .... HISTORY :—1-2 .... ESSAYS : ... Wednes
JUNIOR.	1st SEMESTER.	PHYSICS :—1 .... 1st Div. 9½, 2d Div. 11½. HISTORY :—6 w .... 3. GREEK :—1 less 6 w. 2d Div. 9½, 1st Div. 10½. FRENCH :—1 .... 1st Div. 8¼, 2d Div. 9½. SPEECHES : .... 4 to 6.	PHYSICS :—1 .... 1 BIOLOGY :—1 less 6 or SURVEYING :— HISTORY :—6 w .... GERMAN :—1 .... SPEECHES : ....
	2d SEMESTER.	CHEMISTRY :—1 .... 11½. GREEK :—3 w .... 4. LATIN :—1 less 3 w .... 9½. ASTRONOMY :—2-5 .... 10½. FRENCH :—3-5 .... 9½. SPEECHES : .... 4 to 6.	CHEMISTRY :—1 .... GERMAN :—1 .... or ANAL. MECHAN or LAB. PHYSICS : - ASTRONOMY :—2-5 . ZOÖLOGY :—3-5 .... SPEECHES : ....
SENIOR.	1st SEMESTER.	LOGIC AND PSYCHOLOGY :—1 .... 9½. Electives. *Latin and Greek* :—1 .... 11½. *German* :—1 .... 10½. *English Literature* :—1-2 .... 4. *Political Economy* :—1-2 .... 3. *History* :—1 .... 4. *Chemistry* :—1 .... 2 to 4. *Astronomy* :—1 .... 2. *Surveying* :—1 .... 8¼ to 12½. *Zoölogy* :—1 .... 8¼. *Botany* :—1 .... 8¼. *Mineral. and Lithol.*:—1 .... 11½.	LOGIC AND PSYCH Electives. *French* :—1-2 .... *German* :—1 .... *English Literature* : *Political Economy* :- *History* :—1 .... *Chemistry* :—1 .... *Astronomy* :—1 .... *Zoölogy* :—1 .... *Botany* :—1 .... *Mineral. and Lithol*
	2d SEMESTER.	Electives. *Moral Phil. and Hist. of Phil.*:—1 .... 9½. *Latin and Greek* :—1 .... 11½. *German* :—1 .... 10½. *French* :—3-5 .... 11½. *Italian or Spanish* :—2-5 .... 5. *English Literature* :—1-2 .... 4. *International Law* :—1-2 .... 3. *History* :— .... 4. *Chemistry* : .... 2 to 4. *Astronomy* : .... 2. *Zoölogy* :—1 .... 8¼. *Botany* :— .... 8¼. *Geology* :— .... 11½.	Electives. *Moral Phil. and Hi* *German* :—1 .... *Italian or Spanish* :- *English Literature* :- *International Law* :- *History* :—1 .... *Chemistry* :—1 .... *Astronomy* :—1 .... *Zoölogy* :—1 .... *Botany* :—1 .... *Geology* :—1 ....

6. GREEK.—*Grammar.* Hadley's or Goodwin's; *the Etymology must be thoroughly mastered.*

Prose Composition.—Jones's Exercises, with special reference to the writing of Greek with the accents, and to the general principles of syntax. Arnold's Exercises are taken as an equivalent.

Reading.—Three books of Xenophon's Anabasis. The so-called Continental sound of the vowels and diphthongs, and pronunciation according to the written accent, are preferred. In preparation, Boise's First Greek Lessons will be found valuable.

Two full years of daily recitation in Greek are essential to success.

II.—LATIN AND SCIENTIFIC COURSE.

Candidates for this course will be examined in French and in all the studies required for the Classical Course, excepting what is above required in Grecian History, in paragraph 3, and what is included in paragraph 6, GREEK. A general knowledge of all the principles of French Grammar and of French construction is required, together with some experience in the reading of easy, descriptive French. The amount of reading should be the equivalent of 75 pages in Bôcher's Otto's French Reader. Candidates using Duffet's French Method may prepare themselves in the whole of that work (2 Parts, including all the French reading matter therein contained) and in the equivalent of 35 pages of Bôcher's Reader. Those using Fasquelle's or Otto's French Course may learn with profit the French verbs from Hennequin's Treatise on the French Verbs, and are recommended so to do.

Any students who are unable to procure satisfactory preparatory instruction in French, may present an equivalent in German, and after admission to the University, make up their French by the aid of outside instruction.

III.—GREEK AND SCIENTIFIC COURSE.

Candidates for this course will be examined in all the studies required for the Classical Course (excepting what is above included in

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There is still considerable diversity of opinion among scholars as to the correct sound of v, and though the sound of ou in the French oui, or practically the sound of our w, is given to this consonant here, the sound of English v may be given, if preferred. The other consonants are sounded as in English.

The rules for syllabication are the same as in the old pronunciation, where two consonants come together; but a single consonant between two vowels is to be joined in pronunciation with the latter.

paragraph 5, LATIN), and in French. The requirements in French are the same as for admission to the Latin and Scientific Course.

IV.—SCIENTIFIC, ENGINEERING AND ARCHITECTURAL COURSES.

Candidates for these courses will be examined in the following studies:

1. ENGLISH LANGUAGE AND GEOGRAPHY.—In both, same as in Classical Course.

2. HISTORY.—Swinton's or Freeman's or Anderson's Manual of General History, or an equivalent.

3. MATHEMATICS.—Same as in Classical Course.

4. FRENCH.—Same requirement as the present for admission to the Latin and Scientific Course.

5. NATURAL PHILOSOPHY.—Cooley's "Text-book of Natural Philosophy," or Rolfe and Gillet's "Hand-book of Natural Philosophy," or an equivalent.

6. BOTANY.—The elements of Vegetable Anatomy and Physiology, as given in the first 27 chapters of Gray's Lessons, or the First and Second Parts of Wood's "Class-book of Botany."

7. ZOÖLOGY.—The elements of Comparative Anatomy and Physiology, as given in Cleland's "Animal Physiology," or Huxley's and Youmans's Physiology and Hygiene.

8. ENGLISH LITERATURE.—Shaw's Manual of English Literature, (Backus's Edition) or Stopford Brooke's English Literature.

9. GEOMETRICAL DRAWING.—The principles of Geometrical Drawing, Tinting and Shading, as contained in Warren's "Drafting Instruments," and Drawings of all the figures of the Third Division of the Book, and those on Plates, II., III. and IV., or an equivalent. The drawings must be neatly executed with India Ink, on Whatman's drawing paper, or on Bristol board. The "Medium" size drawing paper is recommended, and each sheet should be divided into four plates of equal size. After the work is completed, all the plates should be trimmed to a uniform size of about *eight* inches wide by *ten* inches long. It is advisable to secure only a small number of drawing instruments, but those should be of good quality, that they may an-

swer for class exercises in the University. If more instruments are needed, they can be procured here. German silver instruments are best.

Instruments and materials *required*:—One pair of plain dividers; one pair of dividers with pen and pencil point; one right line pen; a scale; a pair of triangles; a hard pencil, and a piece of India ink. These articles, of good quality, need not cost over $4.00.

V.—SELECTED STUDIES.

Those who do not desire to become candidates for a Degree, may be admitted to any class for such time as they may choose, in case they pass the examinations necessary for admission to the Freshman class, and also exhibit such proficiency as will enable them to proceed advantageously in the particular studies which they propose to pursue. With such students an equivalent of German will be accepted in lieu of the French required for admission to certain courses.

Advanced scientific students who desire to pursue certain subjects as specialties, such as Chemistry, Geology, Astronomy, etc., may have the privilege of doing so, with consent of the Professor in charge of such studies.

VI.—ADVANCED STANDING.

Candidates for advanced standing will be examined in the previous studies for the course they propose to enter, and, if they come from another institution, will present certificates of honorable dismission.

VII.—THE EXAMINATION FOR ADMISSION.

An examination for admission to the Department of Literature, Science, and the Arts, will take place on Saturday and Monday, June 23d and 25th, 1877, and another, beginning on Thursday, September 20th, and continuing through the Friday and Saturday and Monday following. These examinations will begin at 9 o'clock A. M. of each day.

The candidate must be provided with credentials from his last instructor, or from the last institution with which he has been connected. These must be presented to the President, at his office, before the candidate can enter upon the examination.

SPECIAL NOTICE TO PREPARATORY SCHOOLS.

A Committee of the Faculty will visit, once every year, any Public High School in Michigan, on request of its School Board, and report its condition to the Faculty.

If the Faculty shall be satisfied from such report that the school is taught by competent instructors, and is furnishing a good preparation for any one or more of our regular courses, then the graduates from such *preparatory course or courses* will be admitted to the Freshman class of the University without examination, and permitted to enter on such undergraduate course or courses as the approved preparatory work contemplated.

They must present to the President within three months after their graduation, the diplomas of their School Board, certifying that they have sustained their examinations in *all* the studies prescribed for admission to one of the three courses, Classical, Scientific and Engineering, or Latin and Scientific. They will also be required to appear at once in their classes, otherwise they can be admitted only after examination.

The privilege of admission on diploma is limited to public schools in Michigan, and their School Boards must make the application annually.*

*** At the beginning of the University year 1876-7 students were received on diploma from the following schools: Ann Arbor, Battle Creek, Coldwater, Detroit, Fenton, Flint, Grand Rapids, Jackson and Pontiac.**

COURSES DESCRIBED.

It will be observed by reference to the Synchronistic Table (opposite page 32) that in the Classical, Scientific, and Latin Scientific Courses an opportunity is offered in the Senior Year for large liberty in the choice of studies.

I.—ENGLISH LANGUAGE AND LITERATURE.

This topic includes four branches of work; first, the study of the origin, growth and laws of our language; second, the study of the art of effective expression, whether by pen or voice; third, the study of the literature of our language; fourth, regular practice in writing and speaking.

Freshmen.—English Language—Tancock's English Grammar; Morris's Elementary Lessons in Historical English Grammar; Earle's Philology of the English Tongue; Tragedy of Julius Cæsar, Rolfe's ed., with Abbott's Shakespearean Grammar. Lectures on Elocution, with exercises for the voice, and the delivery by each student of two original speeches.

Engineers.—In addition to work referred to in the previous paragraph, Rhetoric—Lectures; Hepburn's Rhetoric.

Sophomores.—English Literature—Lectures; Henry Morley's Manual of English Literature. Rhetoric—Lectures; Hepburn's Rhetoric. Exercises in English Composition once each week, with special criticism on each essay in the presence of the appropriate subsection.

Juniors.—English Exercises—*Elective*—Practice in debate, written and extemporaneous, as well as in criticism of argument and in the decision of argued questions. The exercises of each student are carefully criticised by the instructor in charge.

Seniors.—English Literature of 14th and 15th Centuries—*Elective*—Direct study of specimens from Chaucer, Gower, Langland, Wyclif, Occleve and Lydgate. English Literature since the 15th Century—Direct study (results presented in written theses and in oral discussions) of Sackville's Induction; More's Utopia; Sidney's Apologie for Poetrie; Spenser's Faëry Queen, Book I.; Bacon's Essays; Shakespeare's Sonnets; Milton's Paradise Lost, and Areopagitica; Pope's Dunciad; Burke's Reflections on the French Revolution; Wordsworth's Excursion; De Quincey's Confessions of an English Opium Eater.

American Literature—Lectures once each week throughout the year.

II—LATIN LANGUAGE AND LITERATURE.

FRESHMEN.—Cicero de Amicitia or Quintus Curtius; Latin Grammar; Livy, 21st and 22d books; Latin Prose Composition completed.

SOPHOMORES.—Horace; Juvenal; Terence or Plautus; Prosody; Roman History. Lectures on Roman Antiquities.

JUNIORS.—Quintilian; Tacitus; Lectures on Roman Literature.

SENIORS.—The First Book of Cicero's Tusculan Disputations; Books 34th and 35th of Pliny's Natural History; Letters of the Younger Pliny; Lectures on Roman History.

TEACHERS' CLASS.—Virgil. Exercises in exegesis. Latin Prose Composition.

POST-GRADUATES.—Seneca's Prose works; Lactantius.

III.—GREEK LANGUAGE AND LITERATURE.

FRESHMEN.—*First Semester*—Selections from Thucydides, Arrian, and Lucian, contained in Boise and Freeman's Selection from Greek Authors. Greek History. Syntax and Prose Writing. *Second Semester.*—Homer's Iliad, 5 books. Essays on Epic Poetry and the Homeric Age, by the class; lectures by the Professor. History of Greek Literature.

SOPHOMORES.—*First Semester*—The Philippics of Demosthenes. *Second Semester*—Theocritus. The Œdipus Tyrannus of Sophocles; Analysis of Greek Tragedies; Lectures on the Greek Drama.

JUNIORS.—Demosthenes on the Crown; Lectures on the Greek Orators; Plato's Apology.

SENIORS (*Elective*).—*First Semester*—The Prometheus of Æschylus; Lectures on the Greek Tragedy; A critical exegesis of the Agamemnon of Æschylus. Selections from Plato's Phædo.

TEACHERS' CLASS.—Selections from the Anabasis. Exercises in Greek Grammar.

Second Semester—The Clouds of Aristophanes; Lectures on the Greek Comedy. Selections from the Lyric Poets and Lectures on the same. The History of Greek Art.

TEACHERS' CLASS.—Greek Prose Composition; Exercises in Syntax.

POST-GRADUATES.—History of Classical Philology. The Greek Dialects.

The student will have opportunity to read with the instructor whatever author he pleases.

IV.—MODERN LANGUAGES AND LITERATURE.

1. GERMAN.

IN THE CLASSICAL COURSE.

SENIORS.—Whitney's Text-books, Schiller's Die Piccolomini.

IN THE SCIENTIFIC AND LATIN-SCIENTIFIC COURSES.

JUNIORS.—Whitney's Text-books. Lessing's Minna von Barnhelm.

SENIORS.—Gœthe's Tasso. O. Brosin's Schiller und sein Verhältniss zu dem Publikum seiner Zeit. Tieck's The Elves (for translation into German). Lectures.

IN THE ENGINEERING COURSES.

SOPHOMORES (Mining Engineers), and **JUNIORS** (Civil Engineers).—Whitney's Text-books.

II. FRENCH.

IN THE CLASSICAL COURSE.

JUNIORS.—Duffet's French Course and French Literature.

SENIORS.—J. Milsand's L'Esthétique française; Etude sur John Ruskin.

IN THE LATIN-SCIENTIFIC COURSE.

FRESHMEN.—Chardenal's French Exercises; A. Dumas, La Tulipe noire; French Composition; Translation into French (Irving's Sketch-book).

SOPHOMORES.—Brachet's Nouvelle Grammaire française; Racine's Phèdre and Britannicus; Brueys, L'Avocat Patelin; Kenney's Raising the Wind (for translation into French). Lectures.

SENIORS.—Guizot's Corneille et son temps.

IN ALL OTHER COURSES.

FRESHMEN.—Chardenal; Rowan's French Reader; Figuier's Les grandes inventions; French composition and translation of English into French.

Sophomores and Seniors (Scientific Section)—(Continued the present year with the Latin-Scientific Section.)

III. ITALIAN AND SPANISH.

Thirty Lessons in Italian and Spanish are offered to Seniors and Juniors in the second semester.

V.—HISTORY.

I. REQUIRED HISTORY.

IN THE CLASSICAL COURSE.

Freshmen.—Grecian and Roman History; the authors most used are Smith and Merivale.

Sophomores.—Grecian and Roman History completed. During the first two years of the course, an effort is made to give the student, by means of lectures as well as the text-books, as clear an insight as possible into the political life and institutions of Greece and Rome, from their foundation to their decline.

Juniors.—History of Civilization in Europe; Guizot being used as a text-book. Six lectures are given on Historians and Historical Books.

IN THE SCIENTIFIC COURSE.

Sophomores.—Mediæval and Modern History. Lectures.

Juniors—Civilization in Europe, Guizot.

IN THE LATIN AND SCIENTIFIC COURSE.

The same as the History in the Classical Course.

IN THE ENGINEERING COURSES.

Juniors.—Modern History, the same as that taken in the Scientific Course.

II. ELECTIVE HISTORY.

Members of the Classical Course and members of the Latin and Scientific Course, who desire further instruction in history, have an opportunity of electing that study instead of Calculus during the second semester of the Sophomore year. To the students electing this course, daily lectures are given on the period extending from the Revival of learning to the close of the Thirty Years' War. There is further opportunity of electing History as a full study during the whole of the Senior year. Those electing this Senior Course are grouped in sections of twelve or fourteen students each, for the purpose of historical investigation. At the first meeting of the Class in each semester, a series of historical questions are assigned with numerous references to historical authorities. Each of the questions occupies the attention of each section of the Class for one week. Every student is required to read before the Class, in the course of the semester, one Thesis and one Critique, the Thesis being on one of the historical questions, and the Critique being on a Thesis presented by one of the other members of the Class. Every student is further required to investigate each week the question for that week, and to come to the Class prepared to give the results of his investigation. The questions considered during the first semester are on the Constitutional History of England; those during the second are on the Constitutional History of the United States. To the students electing History during the Senior year, three courses of lectures are also given; one on the Government of Great Britain; one on the Governments of the Larger Nationalities of Continental Europe; and one on the Political History of the United States. Two lectures are given each week during the whole of the Senior year.

VI.—PURE MATHEMATICS.

IN THE CLASSICAL COURSE.

FRESHMEN.—*Geometry.*—Exercises in geometrical invention, including theorems and problems, application of Algebra to Geometry, Loci, Maxima and Minima, Transversals, and an elementary knowledge of the Modern Geometry; *i. e.*, PART III. of Olney's Geometry, and *Plane Trigonometry*. *Algebra.*—Theory of Indeterminate Coefficients, Binomial Theorem and its application to the development of Functions, Theory and use of Logarithms, Indeterminate Analysis, the Elements of the Theory of Equations, Sturm's Theorem, and Horner's Method of Solving Higher Equations; *i. e.*, PART III. of Olney's Algebra, or an equivalent in other authors.

SOPHOMORES.—*Trigonometry.*—Spherical. *General Geometry.*—Construction of Equations; Production of Equations of Plane Loci, Transformation of Coördinates and Properties of the Conic Sections. ELECTIVE. *Calculus.*—Differential, including differentiation of Functions of a Single Variable, McLaurin's and Taylor's Theorems with Binomial Theorems and Theory of Logarithms deduced, Maxima and Minima, Functions of a Single Variable, Radius of Curvature, and the Elementary Principles of Tracing Curves; Integral, Elementary

Forms, Binomial Differential, Rectification and Quadrature of Plane Curves, and Volumes of Solids of Revolution.

IN THE LATIN AND SCIENTIFIC COURSE,

Same as in Classical Course.

IN THE SCIENTIFIC COURSE.

FRESHMEN.—*Geometry.*—The same as Classical; *Plane and Spherical Trigonometry, Algebra.*—Same as Classical.

SOPHOMORES.—*General Geometry and Calculus.*—Same as in Classical, including Elective.

IN THE CIVIL ENGINEERING COURSE.

FRESHMEN.—Same as Scientific.

SOPHOMORES.—Same as Scientific to the middle of the Sophomore year, and the General Geometry and Calculus extended through this year.

JUNIORS.—*General Geometry.*—Polar Coördinates, Lines, Planes and Surfaces in space, including Surfaces of the 2d Order. *Calculus.*—Differential, including Functions of Several Variables with a fuller view of the Theory of Curves; Integral, extended so as to include Functions of two Variables and Special Processes of integrating.

IN THE MINING ENGINEERING AND ARCHITECTURAL COURSES.

Same topics as in Civil Engineering Course, pursued in the order indicated in the general table.

VII.—PHYSICS.

The study of Experimental Mechanics, Acoustics and Optics, is pursued during the first semester of the Junior year.

In the second semester the study of Analytical Mechanics (with application of the Calculus), is required of the students in Civil and Mining Engineering, and is elective with German, and will probably be elective with a course of Laboratory work in Physics, by the students of the Scientific Course.

The subjects of Heat, Electricity and Magnetism are included in the instruction given by the Professor of Chemistry.

It is expected that next year provision will be made for giving the students in the Classical and Latin-Scientific Courses, who desire to pursue as an extra study a course of Laboratory work in Physics, an opportunity for exercises in physical experimentation, and for becoming practically acquainted with the instruments and methods of physical investigation.

VIII.—ASTRONOMY.

Besides the instruction mentioned in the Table, there is a Course in Higher Astronomy, which embraces two years, and is optional. It begins with the first semester of the Senior year; and the students who wish to go through the whole course must stay one year after graduation. The lectures during the two years embrace—

1. **Spherical Astronomy, and the Theory of the Instruments.**
2. **Calculation of the Orbits of the Celestial Bodies.**
3. **Numerical Calculus; Theory of Interpolation; Method of the least Squares.**
4. **Physical Astronomy; Calculation of the Special and General Perturbations of Planets, and Perturbations of Comets.**

During the whole time the student has ample opportunity to use the instruments of the Observatory, and to make astronomical calculations.

IX.—GEOLOGY AND MINERALOGY.

The elements of *Mineralogy* and *Lithology* are imparted in the first semester, by means of lectures, recitations, and practical studies in the class-room; Text-book, Dana's "Manual of Mineralogy."

In the second semester the elements of Structural and Historical Geology are presented in a similar manner. Text-book, Dana's Manual of Geology. The lectures on Mineralogy and Geology are illustrated by magic-lantern (sciopticon) slides.

For higher courses in these studies, see "The Polytechnic School."

X.—ZOOLOGY AND BOTANY.

The elements of structural, physiological and systematic *Botany* are imparted in a course of recitations and practical studies, with specimens in hand, with the Classical and Latin and Scientific Freshmen.

The Scientific Freshmen and those Civil Engineering students who elect Botany, study the classification of plants by means of the analysis and careful description of fresh specimens.

The botanical text-books are Gray's Series.

The members of the Scientific and of the Latin and Scientific Sections of the Junior Class can elect a course in *Biology*. This course continues through three-fifths of the first semester. It consists of the study of as many typical forms of animals and plants as can be considered in the time allotted. The specimens, microscopes and other instruments are provided by the University. The student is expected to present correct drawings of the objects examined. One series of these drawings made on a uniform plan is deposited in the Microscopical Laboratory. The text-book employed in this work is McGinley's "Biology."

In the second semester of the Junior year, the members of the Scientific Section are required to take a course in *Zoölogy* continuing through three-fifths of the semester. It is proposed to make this a course in Embryology. The development of the chick in the hen's egg will be followed in detail, microscopically and otherwise. The text-book for this course will be Foster and Balfour's "Elements of Embryology," Part I.

The two preceding courses require work on the part of the student in the Microscopical Laboratory, for details concerning which see "The Polytechnic School."

The elective course of the Senior year is a course in Paleontology, as a preparation for Geology. Text-book, Nicholson's Series.

For special courses in Zoölogy and Botany see "The Polytechnic School."

XI.—LOGIC AND INTELLECTUAL AND MORAL PHILOSOPHY.

Philosophy is taught by text-books and lectures: during the first semester, Logic and Psychology; and during the second semester, Moral Philosophy and the History of Philosophy, and the Evidences of Christianity.

XII.—POLITICAL ECONOMY AND INTERNATIONAL LAW.

The President gives instruction to Seniors during the first semester in Political Economy, and during the second semester in International Law.

XIII.—ANATOMY, PHYSIOLOGY, AND HYGIENE.

A Course of Lectures in Anatomy, Physiology, and Hygiene is given to the Junior Class by the Professor of Anatomy and Physiology.

XIV.—CHEMISTRY AND CHEMICAL MINERALOGY.

The instruction in Chemistry is embraced in a course of lectures to the Medical Class during the first semester, and to the Junior Class during the second, on Elementary Chemistry. The Institution being well supplied with apparatus, these lectures are fully illustrated by experiments, and attended by thorough reviews and examinations. On the basis of chemical classification of minerals, the science of Minerals will be treated in connection with that of Chemistry.

Students most advanced in the science will be admitted into the Analytical Laboratory, and furnished with all the necessary material and apparatus, and will conduct with their own hands, under the direction and supervision of the Professor, a systematic course of Qualitative Analysis. The object of this course will be two-fold: *First*, to make the student familiar, by actual practice, with the principles and laws of science, as well as the properties of the various elements and compounds, and their relation to each other; *Second*, to exercise the student in chemical manipulations, and to enable him to perform analytical investigations.

After a satisfactory completion of Qualitative Analysis, the student may enter upon any of the following courses:

Quantitative Analysis,
Assaying—for Metals,
Toxicological Examinations,
Chemical Mineralogy,
Volumetric Analysis,
Pharmaceutical Preparations,
Ultimate Organic Analysis.

Those who are competent may receive aid in Original Investigations. (See Mining Engineering and Pharmacy under "The Polytechnic School.")

TEXT-BOOKS AND WORKS OF REFERENCE.

Miller's Chemistry,
Bloxam's Chemistry,
Douglas and Prescott's Analysis,
Plattner on the Blow-Pipe,
Brush's Manual of Blow-Pipe Analysis,
Storer's Solubilities,
Fresenius's and Rose's Analysis,
Sutton's Volumetric Analysis,
Dana's Mineralogy,
Watt's Dictionary of Chemistry,
Cavendish Publications,
Knapp's Chemical Technology.

XV.—ENGINEERING.

Instruction in the several subjects pertaining to Civil and Mining Engineering is given by the use of text-books, lectures, reading in the general library, and daily recitations or exercises. The University possesses a good collection of Surveying and Engineering instruments, and ample opportunity is afforded the student to become familiar with their use. For full details of these courses see "The Polytechnic School."

XVI.—DESCRIPTIVE GEOMETRY AND DRAWING.

Thorough instruction is given in Plane Projection Drawing, Isometric, Descriptive Geometry and its applications to Carpentry and Stone-Cutting, Shades and Shadows, Linear Perspective, Topographical Free Hand and Machine Drawing. This course can also be seen by referring to "The Polytechnic School."

XVII.—ARCHITECTURE AND DESIGN.

A complete course of instruction in Architecture and Design is now given. The course is fully described in its proper place in the account of "The Polytechnic School."

TEACHERS' DIPLOMAS.

Any member of the Senior class, who pursues courses of study with reference to preparation for teaching, and who by special examinations shows such marked proficiency as qualifies him to give instruction, may receive a Special Diploma signed by the President and the Professors who have charge of the studies he has taken with this object in view. Classes are organized to meet the wants of those who desire to fit themselves for the work of teaching.

A special examination in the ancient and modern languages and mathematics, for the teachers' diploma, will be held the week before the spring vacation. This diploma is designed to be the certificate of qualification for teaching, and is the only form of recommendation which will be given by the Professors in charge of these studies.

STUDIES, ATTENDANCE AND DISCIPLINE.

No student is expected to pursue more or less than three studies at one time, without special permission of the Faculty.

No student can drop any course or study until he shall have attended the regular examination of the same.

In order to rank in the Calendar in any particular class, a student must, at the time of the publication of the Calendar, have completed (leaving no deficiencies or conditions) the work of that class up to the beginning of the current academic year. Otherwise his name will appear in the roll of the class next below.

The Rules of the University require that every student shall be in his place, at all stated exercises, from the beginning to the close of his connection with the University.

Such delinquencies as tardiness, absence, deficiencies, offenses against good order, in the several departments of instruction, are ordinarily dealt with by the Professor in charge of the department in which they occur. Flagrant cases are reported to the Faculty for adjudication.

Students who are not in their places at the opening of the semester must present written excuses from their parents or guardians for the delay.

Students are not allowed to absent themselves from town without permission from the President.

The State of Michigan extends the privileges of the University, without charge for tuition, to all persons of either sex, who are qualified for admission. Thus it does not receive patronage, but is itself the patron of those who seek its privileges and its honors. It cannot, however, be the patron of idleness or dissipation. Its crowded classes have no room except for such as assiduously pursue the studies of their choice, and are willing to be governed in their conduct by the rules of propriety.

Students are suspended or dismissed. whenever, in the opinion of the Faculty, they are pursuing a course of conduct seriously detrimental to themselves or the University.

The following are extracts from the by-laws of the Regents:

"Concerted absence from any appointed duty by a class or any number of students together, will be regarded as a great violation of good order, and will be followed by suspension or dismission, at the discretion of the Faculty."

"Whenever any Faculty is satisfied that a student is not fulfilling, or likely to fulfill, the purpose of his residence at the University, or is for any cause an unfit member thereof, the President shall notify his parents or guardians, that they may have an opportunity to withdraw him, and if not withdrawn within a reasonable time, he shall be dismissed."

THE FACULTY

OF THE DEPARTMENT OF

LITERATURE, SCIENCE, AND THE ARTS.

JAMES B. ANGELL, LL. D.,
PRESIDENT.
Rev. GEO. P. WILLIAMS, LL. D.,
SILAS H. DOUGLAS, M. A., M. D.,
CORYDON L. FORD, M. A., M. D.,
HENRY S. FRIEZE, LL. D.,
DEAN OF THE FACULTY.
JAMES C. WATSON, Ph. D.,
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CHARLES K. ADAMS, M. A.,
Rev. BENJAMIN F. COCKER, D. D., LL. D.,
ALBERT B. PRESCOTT, M. D.,
MARTIN L. D'OOGE, Ph. D.,
GEORGE S. MORRIS, M. A.,
CHARLES E. GREENE, M. A., C. E.,
MOSES COIT TYLER, LL. D.,
WILLIAM H. PETTEE, M. A.,
W. L. B. JENNEY, C. E.,
JOHN W. LANGLEY, S. B.,
EDWARD L. WALTER, Ph. D.,
ALBERT H. PATTENGILL, M. A.,
JOSEPH B. DAVIS, C. E.,
MARK W. HARRINGTON, M. A.,
WOOSTER W. BEMAN, M. A.,
JOSEPH B. STEERE, Ph. D.,
ISAAC N. DEMMON, M. A.,
ELISHA JONES, M. A.,
P. R. B. DePONT, B. A., B. S.,
CHARLES S. DENISON, C. E., M. S.,
ALFRED HENNEQUIN, M. A.,
CHARLES N. JONES, B. A.,
VOLNEY M. SPAULDING, M. A.,
OTIS C. JOHNSON, B. A.,
SAMUEL T. DOUGLAS, Ph. B., Ph. C.,
ABRAM V. E. YOUNG, Ph. B., Ph. C.,
VICTOR C. VAUGHAN, M. S.,
HENRY B. PARSONS, Ph. C.

STUDENTS.

RESIDENT GRADUATES.

Names.		Residence.
William Burton, B. A.,	*Iowa College*,	Grinnell, Iowa.
Rolla C. Carpenter, M. S.,	*Ag'l Coll.*, C. E., *U. of M.*,	Lansing.
A. D. Churchill, B. S.,	*Knox College*,	Davenport, Iowa.
Ludovic Estes, B. A.,	*Haverford College*,	Westfield, Indiana.
Frank W. Fletcher, PH.B.,	*University of Michigan*,	Detroit.
Abram Sager Hall, PH.B.,	*University of Michigan*,	Ann Arbor.
Absalom W. Jones, M.A.,	*Otterbein Univ., Ohio*,	Flat Rock, Ill.
Albro D. Morrill, B. S.,	*Dartmouth College*,	Tilton, N. H.
Louisa Maria Reed, B. S.,	*University of Michigan*,	Ann Arbor.
Dalston P. Strange, M. S.,	*Agricultural College*,	Grand Ledge.
William Thomas, B. S.,	*University of Michigan*,	Palmyra, Ohio.
Chas. McK. VanCleve, B. A.,	*University of Michigan*,	Ypsilanti.
Olaf Varlo, B. A.,	*University of Michigan*,	Decorah, Iowa.
Albert J. Volland, B. A.,	*University of Michigan*,	Ann Arbor.

SENIORS.

Names.	Course.	Residence.
Osmer Henry Aikine,	Eng.	*Jackson.*
Joseph Sutton Ayres,	Cl.	*Romeo.*
Octavia Williams Bates,	Cl.	*Detroit.*
Holland William Baker,	Eng.	*St. Joseph.*
George Barnes,	Cl.	*Ithaca.*

NOTE.—By our rule, in order to rank in any particular class, a student must have completed (leaving no deficiencies or conditions) the work of that class up to the beginning of the current academic year. Therefore the names of some students appear in the class below that with which they will probably graduate.

We print the names of those students only who have been in actual attendance during the year.

ABBREVIATIONS.—*Cl.*—Classical Course. *L.*—Latin and Scientific Course. *Sc.*—Scientific Course. *Eng.*—Civil Engineering. *M. Eng.*—Mining Engineering. *Arch.*—Architecture and Design.

Alfred Allen Bennett,	Sc.	*Milford, N. H.*
George Stephen Bishop,	Cl.	*Hillsdale.*
Albert Nelson Bliss,	Cl.	*East Calais, Vt.*
Charles Ankeney Bosworth,	Cl.	*Wilmington, Ohio.*
George Preston Brown,	Cl.	*Ann Arbor.*
Granville Williams Browning,	Sc.	*St. Paul, Minn.*
George Alonzo Cady,	Cl.	*Wayne.*
William Carpenter,	L.	*Farwell.*
Herbert Elwood Cary,	Cl.	*Ann Arbor.*
Carlos Bingham Cochrane,	Cl.	*Ann Arbor.*
Branch H. Colby,	Sc.	*Ann Arbor.*
Clara M. Colman,	Cl.	*Ann Arbor.*
George Cary Comstock,	L.	*Ann Arbor.*
Percy Tyler Cook,	L.	*Brooklyn.*
John Samuel Crombie,	Cl.	*Pontiac.*
Mary Emma Farrand,	L.	*Ann Arbor.*
Ogden Winner Ferdon,	L.	*Ann Arbor.*
Frank Clark Ferguson,	Cl.	*Buffalo, N. Y.*
William Barton Ferris,	Sc.	*Buffalo, N. Y.*
Ferris Smith Fitch, Jr.,	Cl.	*Fitchburg.*
Carlton Cassius Frederick,	Sc.	*Buffalo, N. Y.*
Edward Ashley Gilbert,	Cl.	*Grand Rapids.*
John B. Glasgow,	Cl.	*Jackson.*
Lulu Goodrich,	L.	*Ann Arbor.*
William John Gray,	Cl.	*Detroit.*
Edward Holmes Guyer,	Cl.	*Rock Island, Ill.*
Maria Louise Hall,	L.	*Ann Arbor.*
Edward Anderson Halsey,	Cl.	*Chicago, Illinois.*
Albert William Hard,	L.	*Ottawa, Illinois.*
Harriet Amanda Holman,	Cl.	*Flint.*
Mary H. Hubbard,	L.	*Kalamazoo.*
Lawrence Cameron Hull,	Cl.	*Hamburg.*
Frank Henry Kimball,	Sc.	*Rockford, Illinois.*
Hein Lankheet,	Sc.	*Overisel.*
Ortive E. Latham,	L.	*Monroeville, Ohio.*
Milo Lewis,	L.	*Greenville.*
William Hurley Lightner,	Cl.	*Lock Haven, Pa.*
Charles Emmet Lowrey,	Cl.	*Hackettstown, N. J.*
Mary Olive Marston,	Cl.	*Eau Claire, Wis.*
William McCarroll,	Cl.	*Pontiac.*
Ann Elizabeth McDonald,	Cl.	*Ann Arbor.*
Henry Clay McDougall,	Cl.	*Ypsilanti.*
Joseph Rogers McLaughlin,	Sc.	*Birmingham.*
William James Miller,	Cl.	*Canton, Ohio.*

George Nathan Orcutt,	Cl.	*Hornellsville, N. Y.*
Milo Milton Potter,	Sc.	*Detroit.*
Emma Margaret Pugsley,	L.	*Paw Paw.*
Willis Reed Roberts,	L.	*Norristown.*
William Abel Satterlee,	L.	*Birmingham.*
Herbert Miner Slauson,	L.	*Fort Dodge, Iowa.*
Ernest Franklin Smith,	L.	*Chicago, Illinois.*
Edward Johnson Snover,	Eng.	*Romeo.*
Edward Augustus Stevens,	Cl.	*Peoria, Illinois.*
Margaret Stewart,	Cl.	*Ann Arbor.*
Vernor Jerome Tefft,	Cl.	*Mason.*
J. George Van Winkle,	Cl.	*Eaton Rapids.*
Frank French Williams,	Cl.	*Buffalo, N. Y.*
Affia Jennie Wilson,	Cl.	*Lapeer.*
Melancthon Lloyd Woolsey,	L.	*Ann Arbor.*

JUNIORS.

Names.	Course.	Residence.
Walter Scott Abell,	M. Eng.	*San Francisco, Cal.*
Daniel Ayres Allen,	L.	*Ann Arbor.*
Marion Benjamin Allen,	L.	*Geneva.*
George Franklin Allmendinger,	Eng.	*Ann Arbor.*
Alexis Caswell Angell,	Cl.	*Ann Arbor.*
Clarence Oliver Arey,	Eng.	*Whitewater, Wis.*
Walter Wheaton Augur,	Cl.	*New Orleans, La.*
Florus Alonzo Barbour,	Cl.	*Pontiac.*
Carrie J. Barker,	L.	*Flint.*
Minnie Bary,	Cl.	*Detroit.*
Charles Emerson Beecher,	Sc.	*Warren, Pa.*
Fred Leroy Bliss,	Cl.	*Jackson.*
Dennis James Casey,	Eng.	*Wilmington, Del.*
Eva Chandler,	Cl.	*Pontiac.*
Lemuel Watson Clark,	Sc.	*Centerville.*
J. Rose Colby,	L.	*Ann Arbor.*
Charles Malcolm Cooley,	L.	*Decorah, Iowa.*
Michael Buchanan Danaher,	Cl.	*Ludington.*
Charles M. Daugherty,	Cl.	*Xenia, Ohio.*
David Noble De Tarr,	Cl.	*Boone, Iowa.*
James Dick Du Shane,	Eng.	*Connellsville, Pa.*
Thomas J. Eaman,	L.	*Pinckney.*
John Herbert Edwards,	L.	*Dixon, Illinois.*
George Lee Fisher,	Arch.	*Pontiac.*

Joseph Henry Fiske,	Cl.	*Detroit.*
Randall Palmer Wade Fleming,	Cl.	*Mason.*
Charles Edwin Garner.	L.	*Ann Arbor.*
Franklin Garrison,	Cl.	*West Nassau, N. Y.*
Clarence Griggs,	Cl.	*Ottawa, Illinois.*
John K. Hanson,	Sc.	*Ann Arbor.*
Paul Henry Hanus,	Sc.	*Mineral Point, Wis.*
George Hatfield Harrower,	Cl.	*Albany, N. Y.*
Ellen Clara Hogeboom,	Sc.	*Kalamazoo.*
Edward King Hubbard,	Cl.	*Detroit.*
Lou Hughes,	L.	*Decorah, Iowa.*
William Lee Jenks,	Cl.	*St. Clair.*
John Butler Johnson,	Arch.	*Kokomo, Ind.*
William Chaplin Johnson,	L.	*Detroit.*
Timothy Josenhans,	Eng.	*York.*
Henry Wick Judd,	M. Eng.	*Flint.*
George Wells Knight,	Cl.	*Ann Arbor.*
Eugene George Mann,	M. Eng.	*Ann Arbor.*
Howell C. Moore,	Cl.	*San Jose, Cal.*
William V. Moore,	Cl.	*Detroit.*
Seymour Tenny Morse,	Arch.	*Highland.*
Horace Greeley Myers,	Sc.	*Varna, Illinois.*
Harry Pierce Myrick,	Cl.	*Ann Arbor.*
Albert James Norton,	L.	*Coldwater.*
William Augustus Otis,	Arch.	*Ann Arbor.*
Charles Fernando Owen,	Cl.	*Dearborn.*
Annie Smith Peck,	Cl.	*Providence, R. I.*
Charles Kendal Perrine,	Cl.	*Jackson.*
James Hervey Raymond,	Cl.	*Austin, Texas.*
Jay Junius Read,	Sc.	*Blackberry, Illinois.*
Benjamin Austin Richards,	Eng.	*Chicago, Illinois.*
James Sanderson,	Eng.	*Detroit.*
Orr Schurtz,	Cl.	*Constantine.*
James Truman Shaw,	Cl.	*Detroit.*
Ossian Cole Simonds,	Arch.	*Grand Rapids.*
Frank Leonard Sizer,	Eng.	*Ottawa, Illinois.*
Lyndon Sanford Smith,	Cl.	*Golden, Colorado.*
Hiram Everett Terry,	Eng.	*Avon.*
Cora Ilione Townsend,	Cl.	*Coldwater.*
James Edgar Turtle,	Eng.	*Cheshire, Mass.*
Stewart Douglass Walling,	Cl.	*Circleville, Ohio.*
Horace Bailey Wamsley,	Cl.	*Huntertown, Ind.*
Louis K. Webb,	Sc.	*Kalamazoo.*
Andrew Wenzell,	Eng.	*Detroit.*

Andrew Whitehead,	Cl.	*Coldwater.*
Sydney Buckminster Wight,	M. Eng.	*Detroit.*
Ross Wilkins,	L.	*Detroit.*
George Spencer Willits,	Cl.	*Monroe.*
Theodore John Wrampelmeier,	Cl.	*Louisville, Ky.*

SOPHOMORES.

Name.	Course.	Residence.
William Livingston Axford,	L.	*Holly.*
John White Baker,	Cl.	*Kalamazoo.*
Theodore Melzo Bates,	Eng.	*E. Cleveland, Ohio.*
Charles Spencer Beadle,	Sc.	*Augusta.*
Joseph Allan Beaumont,	Eng.	*Peru, Ind.*
Fred Somers Bell,	L.	*Fort Dodge, Iowa.*
Cora Agnes Benneson,	Cl.	*Quincy, Ill.*
James Stark Bishop,	L.	*Hillsdale.*
John Harris Black,	L.	*Chicago, Ill.*
Mary Lavina Blood,	Cl.	*Waltham, Mass.*
Michael Henry Brennan,	L.	*Ann Arbor.*
Thomas Bertrand Bronson,	Cl.	*Ann Arbor.*
James Padelford Brown,	L.	*Milwaukee, Wis.*
Hubert William Brown,	Cl.	*Ann Arbor.*
William Foster Bryan,	Cl.	*Lafayette, Ind.*
William Henry Butts,	Cl.	*Ann Arbor.*
Mary Elizabeth Byrd,	Cl.	*Lawrence, Kansas.*
George Noble Carman,	Cl.	*Fenton.*
Richard Turner Chandlee,	Sc.	*Still Pond, Md.*
Edmund Adolph Christian,	Cl.	*Wyandotte.*
Frantz Hunt Coe,	Cl.	*Ann Arbor.*
Webster Cook,	Cl.	*York.*
Emma Adelia Crouch,	L.	*Erie, Pa.*
Edward Sweatt Davis,	Eng.	*Waxahachie, Tex.*
Laura Donnan,	Cl.	*Indianapolis, Ind.*
Fannie Clinton Farrand,	Cl	*Ann Arbor.*
Fred Charles Fay,	Cl.	*Fenton.*
Rathbun Fuller,	L.	*Toledo, Ohio.*
Charles Mills Gayley,	Cl.	*Ann Arbor.*
Maria Sara Gerls,	L.	*Pontiac.*
Isaac Channing Goff,	Eng.	*Cleveland, Ohio.*
Thomas C. Green,	L.	*Troy, New York.*
William Albert Greeson,	Cl.	*Kokomo, Ind.*
William V. Grove,	Sc.	*Williamsville, N. Y.*

Leroy Halsey,	Cl.	*Chicago, Ill.*
Frank Dwight Haskell,	Cl.	*Ann Arbor.*
Charles Sumner Henning,	Eng.	*Plano, Ill.*
Cicero Demerit Hill,	Eng.	*Milwaukee, Wis.*
George Horton,	Cl.	*Ann Arbor.*
Edwin Walter Jenney,	Cl.	*Chicago, Ill.*
Fred Parker Jordan,	Cl.	*Battle Creek.*
Maya V. Lee,	L.	*Lancaster, N. Y.*
Lorenzo John Locy,	Sc.	*Flint.*
Frank Voorhees Luse,	M. Eng.	*Louisville, Ky.*
Newton McMillan,	Cl.	*Ann Arbor.*
Frank Day Mead,	Cl.	*Ann Arbor.*
Jesse Fonda Millspaugh,	Cl.	*Battle Creek.*
H. Throop Morley,	M. Eng.	*Marine City.*
Thomas Henry Noble,	M. Eng.	*Elk Rapids.*
Mark Norris,	L.	*Grand Rapids.*
Wilmot Smith Pennington,	Cl.	*Mason.*
James Elijah Pilcher,	Cl.	*Detroit.*
Irving K. Pond,	Eng.	*Ann Arbor.*
Henry Camp Post,	M. Eng.	*Grand Rapids.*
John Charles Quintus,	M. Eng.	*Grand Rapids.*
John Ross Russel,	Cl.	*Detroit.*
Albert William Ryan,	Cl.	*Mt. Clemens.*
Lyman Balcom Sailor,	Cl.	*Allegan.*
Kenneth Russell Smoot,	Cl.	*Ann Arbor.*
Douglas Houghton Stringham,	Cl.	*Ann Arbor.*
Sarah Elizabeth Swift,	Cl.	*Wayne.*
Nellie Truesdel,	Cl.	*Whitmore Lake.*
John Hubbard Tweedy, Jr.,	Cl.	*Milwaukee, Wis.*
Evert Van Pelt,	Eng.	*Buffalo, N. Y.*
Lucius Lincoln Van Slyke,	Cl.	*Pike, N. Y.*
Charles Gilbert Van Wert,	L.	*Norvell.*
Eli Warstler,	Cl.	*St. Johns.*
Elmer Randolph Webster,	Cl.	*White Lake.*
Enoch Clark White,	Cl.	*Lapeer.*
E. Fred Wood,	Eng.	*Ann Arbor.*
George Deming Wright,	Cl.	*Fenton.*

FRESHMEN.

Name.	Course.	Residence.
John Jacob Abel,	L.	*Cleveland, Ohio.*
Frank Gates Allen,	Cl.	*Aurora, Ill.*
Dennis Eldred Alward,	Cl.	*Niles.*
Josiah Little Ambrose,	L.	*Chicago, Ill.*

Edward Playfair Anderson,	Cl.	*Ottawa, Kansas.*
Ralph Arthur Angell,	L.	*Wenona,*
Henry Winfield Ashley,	Cl.	*Toledo, Ohio.*
John Ayers,	Eng.	*Fort Smith, Ark.*
F. Belle Bailey,	Cl.	*Fulton, Mo.*
Frank Dymond Baker,	Cl.	*Flint.*
Richard Bayard Bancroft,	Cl.	*Port Huron.*
Archie W. Banks,	Sc.	*Ann Arbor.*
Henry Spaulding Bangs,	Cl.	*Fenton.*
Orlando Fleming Barnes,	Cl.	*Lansing.*
Charles Augustus Barry,	L.	*Ann Arbor.*
Samuel Lloyd Beaumont,	M. Eng.	*Ann Arbor.*
Gustav Frederic Behr,	Sc.	*Ann Arbor.*
Clarence Edwin Bement,	Cl.	*Lansing.*
John Biddle,	L.	*Grosse Isle.*
Josiah Bond, Jr.,	Cl.	*Kenosha, Wis.*
John Marion Brewer,	Cl.	*Romeo.*
Edward Miles Brown,	L.	*Schoolcraft.*
Isaac Howard Bullock,	Sc.	*Kelton, Penn.*
Arthur William Burnett,	Cl.	*Tecumseh.*
James David Callahan,	Cl.	*Mina, N. Y.*
Carina B. Campbell,	Cl.	*Monroe.*
Charles Hotchkiss Campbell,	L.	*Detroit.*
Edwin Lyon Chapman,	L.	*Monroe.*
John Chase,	Cl.	*Ann Arbor.*
Chauncey Ferris Cook,	Cl.	*Hillsdale.*
J. C. Waterson Cowley,	Cl.	*Pontiac.*
Ismena Cramer,	L.	*Ann Arbor.*
Julia Melissa Crouch,	L.	*Erie, Penn.*
Lewis Franklin Culver,	Cl.	*Quincy.*
Andrew Strong Deacon,	Eng.	*Harrisonville, Mo.*
Richard Gay De Puy,	Cl.	*Ann Arbor.*
Frank Merrill Dunlap,	Eng.	*Detroit.*
Samuel Houston DuShane,	L.	*Connellsville, Penn.*
James T. Eaglesfield,	Cl.	*Terre Haute, Ind.*
Thomas Randolph Edwards,	L.	*Ann Arbor.*
Judson Pratt Etheridge,	Cl.	*Coldwater.*
John Thomas Ewing,	Cl.	*Ionia.*
David Felmley,	Cl.	*Perry, Ill.*
Fred. Knowlton Fernald,	L.	*Adrian.*
Charles Henry Fisher,	Cl.	*Tecumseh.*
Fred Wilbur Fonda,	Cl.	*Coldwater.*
Jay Fuller,	L.	*Buchanan.*
Charles Alfred Fyke,	Cl.	*Ann Arbor.*

Arthur R. Garbutt,	L.	*Drayton Plains.*
Don Alonzo Garwood,	Cl.	*Cassopolis.*
George Mahlon Gillette,	L.	*Niles.*
Helena A. Gœcker,	L.	*Jackson.*
Mary Henrietta Graham,	L.	*Ann Arbor.*
Charles Howard Greathouse,	Cl.	*Uniontown, Ky.*
John Alexander Green,	Cl.	*Austin, Texas.*
Fredric James Gurney,	Cl.	*Chicago, Ill.*
Norman Washington Haire,	Cl.	*Leslie.*
William Washington Hannan,	Cl.	*Dowagiac.*
Mary Catharine Haskell,	L.	*Marshall.*
Clark Wilder Hawley,	Sc.	*Aurora, Ill.*
Idella Medora Hawley,	L.	*Aurora, Ill.*
Thomas Lorenzo Heaton,	L.	*Potsdam, N. Y.*
William Helmle,	Cl.	*Springfield, Ill.*
George Hempel,	Cl.	*Ann Arbor.*
Forman Spencer Hendrickson,	L.	*Ann Arbor.*
Minnie Alice Hewit,	L.	*Marshall.*
William Henry Honey,	Cl.	*Ypsilanti.*
James Edmund Hunt,	Cl.	*Toledo, Ohio.*
Ledru Rollin Hunter,	Cl.	*South Lyon.*
Jerry Whipple Jenks,	Cl.	*Rock Falls.*
Frank Arthur Johnson,	Cl.	*Ann Arbor.*
William Kemper Jones,	Cl.	*Grand Rapids.*
Jessie Kennedy,	L.	*Eau Claire, Wis.*
Brayton Daniel King,	Eng.	*Ann Arbor.*
James R. Laing,	Sc.	*Ann Arbor.*
Edward Bowen Lewis,	Eng.	*Ionia.*
Peter Burr Loomis, Jr.,	Cl.	*Jackson.*
Frank Wood Loveland,	M. Eng.	*Golden, Colorado.*
Milton Mozart Marble,	Cl.	*Ann Arbor.*
Joseph Henry Matthews,	M. Eng.	*Canton, Ohio.*
Mabel Maxwell,	Sc.	*Boulder, Colorado.*
Charles King McGee,	Cl.	*Jackson.*
Robert Henry McMurdy,	Cl.	*Niles.*
Charles Alexander McMurray,	Cl.	*Normal, Ill.*
Philetus Robert Middlesworth,	Sc.	*Linden.*
Duncan Wolcott Miller,	Eng.	*Bowne.*
Charles Sumner Mitchell,	L.	*St. Cloud, Minn.*
Frederick Clemens Myrick,	L.	*Ann Arbor.*
William Wallace Nash,	M. Eng.	*Ottawa, Ill.*
Martin Charles Neuberger,	Cl.	*Fort Wayne, Ind.*
Leroy Stephen Norton,	L.	*Shabbona, Ill.*
Frank Russell Osborn,	Cl.	*Niles.*

Charles Evart Paddock,	M. Eng.	*Grand Rapids.*
Delos Leonard Parker,	L.	*Marine City.*
Carrie Cook Parrish,	Cl.	*Ann Arbor.*
Fred Albert Patrick,	Sc.	*Marengo, Ill.*
Fred Polhemus,	Eng.	*Ann Arbor.*
Cyrus Augustus Pomeroy,	Cl.	*Ann Arbor.*
Allen Bartlit Pond,	Cl.	*Ann Arbor.*
Augustus Van Rensselaer Pond,	L.	*Quincy.*
Alice Porter,	L.	*Ann Arbor.*
Albert Jay Potter,	L.	*Niles.*
Francis Anna Prentiss,	Cl.	*Bay City.*
Frank Fremont Reed,	Cl.	*Ann Arbor.*
Charles Joshua Reynick,	Cl.	*Caro.*
Harry Slade Richards,	L.	*Paw Paw.*
Julius Rodman,	Cl.	*Coldwater.*
Arthur Raymond Rood,	L.	*Lapeer.*
Louis Marcellus Russell,	Cl.	*Leslie.*
Henry Chase Safford,	Cl.	*Coldwater.*
Frank Satterlee,	Eng.	*Birmingham.*
Frank P. Secor,	Cl.	*Racine, Wis.*
Edwin Stanton Sherrill,	Cl.	*Detroit.*
John J. Shields,	Cl.	*Stilesville, Ind.*
Herbert Walter Smith,	L.	*Ann Arbor.*
J. Warren Smith,	Cl.	*Eaton Rapids.*
Samuel Marston Stocker,	L.	*Muscatine, Iowa.*
Jefferson Ray Thomas,	Sc.	*North Plains.*
Malcolm Parker Thomas,	Cl.	*Schoolcraft.*
William Mann Thompson,	Cl.	*Jackson.*
Henry Holmes Treadway,	Cl.	*Pontiac.*
Charles Wellington Tufts,	Cl.	*Leslie.*
Edward T. Van De Vanter,	Cl.	*Sturgis.*
Alice Van Hoosen,	Cl.	*Rochester.*
Byron Sylvester Waite,	Sc.	*Fenton.*
William Dow Washburn,	Cl.	*Platteville, Wis.*
John Charles Waterman,	Eng.	*Grand Rapids.*
Edward L. Webster,	Sc.	*Jackson.*
Charles Chase Whitacre,	M. Eng.	*Chicago, Ill.*
Louis Davenport Wight,	Sc.	*Detroit.*
John Haven Willard,	L.	*Chicago, Ill.*
Charles Moseman Wilson,	L.	*Ionia.*

STUDENTS IN SELECTED STUDIES.

Name.	Residence.
Edward James Bird,	*Bay View, Wis.*
Llewellyn Howell Davis,	*Fenton.*
George M. Davison,	*Ann Arbor.*
Oscar Dunham,	*Toledo, Ohio.*
Clara Belle Hawley,	*Mason.*
Ella Hutchins,	*Ionia.*
Henry Town Kent,	*Toledo, Ohio.*
William Gray Lapham,	*Northville.*
Theodore S. McCoy,	*Van Wert, Ohio.*
Erastus Fletcher Mearkle,	*Clearville, Pa.*
Thomas Ramon More,	*Santa Barbara, Cal.*
William Herbert Murphy,	*Detroit.*
Albert Samuel Pettit,	*Ann Arbor.*
Frank Homer Terry,	*Rochester, Ind.*
Alice Emeline Tracy,	*Platteville, Wis.*

THE POLYTECHNIC SCHOOL.

THE University has for years given advanced instruction in the mathematical, physical and natural sciences, and thorough courses in the practical application of these sciences to the arts. We have now given to the different branches of such work a closer grouping, a more compact organization, and an ampler development, and have recognized by name what we have already had in fact, The Polytechnic School. It comprises the course in Civil Engineering, the School of Mines, the course in Architecture and Design, Advanced Courses in Science, and the School of Pharmacy.

The work is arranged with reference to the wants of two classes of students:

First. Those pursuing the study of Civil or Mining Engineering, or Architecture and Design, or the study of Pharmacy, (which includes an extended course in Analytical Chemistry) with the view of graduating.

Secondly. Graduates of colleges and other persons qualified for advanced or special study of Mineralogy, Geology, Zoölogy, Botany, Civil or Mining Engineering, Architecture and Design, Physics, Analytical and Applied Chemistry, Pharmacy or Metallurgy.

In the Museum of Scientific Collections with its specimens, in the spacious and well appointed Chemical, Microscopical and Mineralogical Laboratories, in the Engineering Instruments and Models, in the Architectural Collection, and in the apparatus of the several departments of science, large facilities for illustrative teaching and study are furnished.

The general scope of the work and of the advantages offered for it is indicated in the descriptions which follow:

I. CIVIL ENGINEERING.

The University aims, by the course of study pursued in the department of Civil Engineering, to lay a foundation of sound theory, sufficiently broad and deep, to enable its graduates to enter understandingly on the further investigation of the several specialties of the profession, and, at the same time, to impart such a knowledge of the usual practice of an office, and of an engineering field party, as shall make its students useful in any position to which they may be called. The adaptation of theory to practice can be thoroughly learned only by the training of actual experience; whatever experience can be gained in a college course, under the guidance of those who have had this training, the University encourages its students to acquire.

A successful completion of the *full course* is necessary to entitle a student to a degree in Civil Engineering; but select students, not candidates for a degree, may pursue any such studies (three in number) as they may prefer, provided they are found prepared to join the classes in those studies; and they will be expected to attend all the lectures, recitations and examinations with the regular students.

Graduates of the Classical, Scientific, and Latin Scientific courses, and of other colleges whose courses of instruction are equivalent to ours, are admitted to the degree of Civil Engineer after attendance on, and a satisfactory examination in, the technical subjects alone of this course as set forth in the schedule on the following pages, in addition to the Mathematics and Analytical Mechanics of the Junior year. These studies can be completed in two years.

Each candidate for graduation must also submit a Thesis upon some approved subject, accompanied by the proper drawings, and must be prepared to pass an examination on the same before he is recommended for a degree.

Every student in Surveying is afforded abundant opportunity of becoming familiar with the excellent assortment of instruments owned by the University, in number sufficient to equip well its classes, and embracing all of the usual assortments for actual work.

Field practice is a portion of the regular course. The classes in surveying are drilled in all that pertains to that branch of engineering; they make surveys, traverse them, calculate contents, divide up land, and solve problems in heights and distances from data taken by the members themselves. They also determine the meridian and take observations for latitude. This work is done during the fall months of the Junior year; during the winter the finished plans of the surveys are made.

The classes in railroad engineering have practice in running curves and levels, and in the measurement of earthwork. They are also, near the close of the Junior year, taken into the field, as a railroad party, under competent and skilled supervision, for two or three weeks continuously, when they go through all the field work for a projected line; reconnoisance, preliminary and location surveys, cross sectioning, staking out, contouring and topography, doing all the work up to the point of actual construction. An accurate plan and profile, carefully made by each student from the field notes of the party, completes this portion of the subject, and serves to fix the practical application of the principles obtained from the text-books and lectures.

A course of instruction is given in Analytical and Applied Mechanics, by both text-books and lectures, the work being shaped especially for the needs of engineering students.

The study of the Strength of Materials and the Theory of Construction covers a course of recitations and lectures for an entire year. Rankine's Manual of Civil Engineering is used during the greater portion of this time, with full explanations, examples and problems. The student is made familiar with both the analytical and graphical methods of treatment, as recently developed and applied, and thus possesses an advantageous proof of the accuracy of his calculations.

The instruction is illustrated also by models, drawings, photographs, lithographs, etc., including a fine collection of details of Iron Bridges, reproduced in wood to one-third scale, by Carl Bock, of Dresden; full sized details of top and bottom chord connections of an Iron Truss, giving an exact representation, from an existing bridge, of the American system of pin connections; full sized details of a Pratt Truss with wooden chords; model of a complete Howe Truss railway bridge, on a scale of one-twentieth; photographs and lithographs of the constructions of the best American bridge companies; set of photographs of Fourth Avenue Improvement, New York city; working drawings of a number of bridges; set of samples of rolled shapes in iron, etc. This collection is receiving additions from year to year by gifts and by purchase, and is invaluable to the student. The latest and best books on professional subjects are added yearly to the library, where they are accessible to all, and frequent references are made to them in the class-room, as the various subjects are brought forward.

Contemporaneously with this course of study the class are required to work out problems in engineering design, or the application of theory to actual cases. The students are furnished with the usual data for a design, and the kind or type of structure is indicated. They are then expected to make the necessary calculations for proportioning the different parts, and to present, at a specified date, complete working drawings, with full details and figured dimensions, accompanied by bills of material. The graphical method is applied to each problem.

A very extended and complete course of Mechanical Drawing, with kindred studies, is pursued during the greater part of the four years. It commences in the Freshman year, with Warren's Plane Projection Drawing, and the first principles of coloring, shading, determination of shadows, isometric projection, etc.; the class next take up Descriptive Geometry, with construction of original problems in the drawing-rooms, and close with practice for one-half a semester in Free-hand Drawing. In the Sophomore year the students advance to Topographical Drawing and the use of Conventional Signs, Ornamentation and Lettering; Mechanism, with lectures on the principles, and drawing of parts of machines. In the second semester they are instructed in Shades and Shadows, Linear Perspective, and Drawing for Stone Cutting. Examples from numerical data are always given, and working drawings are made from these data. In the Junior year, plans of surveys, plane table work, and finished map and profile of the railroad line run by the class are made. The Senior class are occupied with the designs in Engineering Construction and, later, with their Thesis Drawings.

Besides the course of lectures on Pure Mechanism, a course is given, in the Senior year, upon the principles of Machine Construction, and an explanation and analysis of the action of the Prime Movers;—Turbines and other Water-Wheels, the Steam Engine, etc. Portions of Machines, Working Models of Turbines, the Steam Engines and Pumps running in the University buildings, Drawings, Photographs, etc., are used to illustrate the instruction.

The drawings made by the different classes during the year are retained until the close of the same, when they are displayed, at Commencement, in the several drawing-rooms, to those who may desire to inspect them.

Examinations, usually written, are held at the close of each study, or at the end of a semester. But at any time, without previous notice, the classes may be examined on any portion of their previous work, to test their actual knowledge, and as much account will be made of the results of such examinations as of the regular ones, to determine the student's fitness to pass in that branch.

REQUIREMENTS FOR ADMISSION.

The requirements for admission are the same as those for admission to the Scientific Course. They may be found on page 34.

THE COURSE OF STUDY.

The course of study at present pursued is as follows, the technical branches being printed in SMALL CAPITALS. (Those branches not technical will be found much more in detail on pp. 37–45.)

FRESHMEN.—*Mathematics.*—Part III. of Olney's Geometry. Plane and Spherical Trigonometry. Part III. of Olney's Algebra, or an equivalent in other authors.

GEOMETRICAL DRAWING.—Warren's Plane Projection Drawing. Use of India Ink and Water Colors. Isometric Projection.

DESCRIPTIVE GEOMETRY.—Church's, and Drawing of Problems in Descriptive Geometry.

French.—Translation from French into English, and from English into French. French Composition and Conversation.

English Language.—Lectures. Exercises in Elocution and in Grammatical Criticism.

Rhetoric.—Lectures; Hepburn's Rhetoric. Exercises in English Composition.

Botany (Optional).—Elements of Structural and Systematic Botany.

FREE-HAND DRAWING.

SOPHOMORES.—*Mathematics.*—General Geometry and Calculus.

Physics.—Mechanics, Acoustics and Optics. Deschanel's Textbook. Lectures.

DRAWING.—Ornamentation and Lettering. Topographical Drawing. Lectures on Principles of Mechanism. Machine Drawing; from Models and Machinery. Shades and Shadows, Church's. Linear Perspective. Stereotomy.

Chemistry.—Elementary Chemistry. Heat, Electricity and Magnetism. Lectures.

Astronomy.—Descriptive.

English.—Essays.

JUNIORS.—SURVEYING.—Lectures. Theory and adjustments of Level, Transit, Compass, Solar Compass, Plane Table, and Sextant. Henck's Field-book for Engineers. Rankine's Civil Engineering, Part III., Chap. I. Levelling, Topography, Staking out Work, Computation of Quantities, Preparation of Estimates, Field Practice, Drawing of Plans, Maps, and Profiles;—all with special reference to the details of actual practice.

ASTRONOMY.—Computation of Time, Latitude, and Longitude.

Mathematics.—General Geometry and Calculus.

History.—Mediæval and Modern History; Lectures.

Analytical Mechanics.—Wood's Analytical Mechanics, with Lectures.

German.—Whitney's Grammar, Exercises, and Reader. German Composition and Conversation.

SENIORS.—CIVIL ENGINEERING.—Rankine's Civil Engineering, Parts II. and III., and Lectures. Materials and Structures. Principles of Stability and Strength, Resistance of Materials, Beams, Trusses, Girders, Roofs, Bridges, in Wood and Iron; Arches, in Stone and Iron; Stress Diagrams and Graphical Methods; Earthwork, Masonry, Retaining Walls, Foundations, Tunnels, Flow and Distribution of Water. Sanitary and Hydraulic Engineering, Drainage and Sewerage, Canals and Tidal Works.

ENGINEERING DESIGN.—Original Problems and Designs for Roofs, Bridges and Structures of Wood, Iron and Stone. Working and Detail Drawings; Bills of Materials, Diagrams and Strain Sheets.

MACHINERY AND PRIME MOVERS.—Theory and Construction of Machines. Water-Wheels. Steam Engine.

Mineralogy and Geology.—Mineralogy and Lithology. Dynamical and Historical Geology.

German.—Study of German continued.

Elective.—Chemistry, Astronomy, Engineering Design, etc.

Preparation of Graduating Thesis.

ADVANCED COURSE.

An advanced course of study is offered to graduates of the Civil Engineering Course and to Resident Graduates. It will consist of:

CIVIL ENGINEERING.—Further investigations of the Theory of Construction, more especially in the direction of Continuous Girders, Revolving Draw-Spans, Rigid and Braced Arches, etc.

Also of a more extended course on the Steam Engine and other Prime Movers.

PROJECTS IN ENGINEERING.

MATHEMATICS.—Calculus of Variation.

ASTRONOMY.—*Theoretical Astronomy.*—Numerical Calculus, Theory of Interpolation and Quadratures, Method of Least Squares. Calculation of the special and general Perturbations of Planets and Perturbations of Comets.

PHYSICS.—Work in Physical Laboratory and Mathematical Theory of Light and Sound. Heat, Electricity and Magnetism.

CHEMISTRY.—Qualitative and Quantitative Analysis.

GERMAN AND FRENCH.—Advanced Studies.

II. SCHOOL OF MINES.

At the session of the State Legislature in 1875, an act was passed to provide for the establishment of a School of Mines at the University. In this act provision was made for the appointment of a Professor of Mining Engineering, a Professor of Metallurgy, and a Professor of Architecture and Design, with the necessary assistant instructors. A liberal appropriation was also made for the purchase of special apparatus and for the general equipment of the School. In compliance with this act of the Legislature, the school was opened for the reception of students in September, 1875, and steady progress has been made in the fitting up of the metallurgical laboratory, and in securing the necessary appliances for imparting the highest theoretical and best practical instruction possible.

The requirements for admission to the School of Mines are the same as those for admission to the Scientific Course. See page 34.

The regular course of study covers four years, but students may be admitted to advanced standing, if properly qualified, at any time prior to the beginning of the fourth year. Those who complete the full course of study, pass all the required examinations, and present a satisfactory thesis upon some topic connected with mining or metallurgy, will receive the degree of Mining Engineer. Special students, not candidates for a degree, may also be allowed to take such portions of the course of study as they may be found qualified, upon examination, to take with profit.

For the first two years the studies pursued by the students in this School are nearly the same as those pursued by the candidates for the degree of Civil Engineer. In the last two years of the course, some of the studies of the Civil Engineering course are taken, but the chief attention is directed to the subjects of Mineralogy, Geology, and Chemistry, with their applications to Mining, Metallurgy, and Assaying. The details of mining and metallurgical practice are taught in the fourth year.

COURSE OF STUDY.

FRESHMEN.—*Mathematics; French; Descriptive Geometry; Geometrical Drawing; English Language; Rhetoric; Free-Hand Drawing.*—Same as in the Civil Engineering Course.

SOPHOMORES.—*Mathematics; Physics; Chemistry; Descriptive Astronomy; Essays.*—Same as in the Civil Engineering Course.

German.—Whitney's Text-books.

JUNIORS.—*Mathematics; Analytical Mechanics; Land Surveying and Field Work.*—Same as in the Civil Engineering Course.

Mineralogy and Lithology.—Lectures. Dana's System of Mineralogy. Von Cotta and Lawrence's Lithology. Systematic Practice in determining minerals and rocks by means of their physical properties.

Analytical Chemistry, qualitative and quantitative.—See page 78.

SENIORS.—*Geology.*—Dana's Manual of Geology. Lectures. Economic Geology. Phenomena of Veins and Mineral Deposits. Von Cotta's Treatise on Ore Deposits, translated by Prime. Special Geology of mining districts. Palæontology.

Analytical Chemistry.—Examination of fuels, furnace products, slags, and refractory materials. Gas analysis, analysis ot air of mines.

Assaying.—See page 79.

Mining Engineering.—Lectures, with constant reference to standard works. Explorations, boring, shaft sinking, tunnelling, laying out of mines, excavating, motors, transportation, hoisting, ventilation, drainage, and pumping, the water supply, treatment of fires in mines, ore dressing, and the elucidation of the principles involved in each case.

Mine Surveying.—Lectures. Practice upon problems and in plotting. Study of plans and sections of mines.

Metallurgy.—Lectures, with frequent reference to the works of Percy, Kerl, Phillips, and others. Principles of smelting; fuels; furnace construction; fire-proof materials; problems in calorific power and calorific intensity; slags; special processes for copper, lead, silver, gold; metallurgy of iron; varieties of iron and steel; treatment of ores containing arsenic, antimony, nickel, cobalt, bismuth, tin, and other metals.

Resistance of Materials; Machinery aud Prime Movers.—With Civil Engineering Seniors.

For the first two years the students of the School of Mines pursue nearly all their studies in connection with the Civil Engineering classes; but for the remainder of the time the separation between the courses of Civil and Mining Engineering is more marked. For details relating to the branches pursued in common in the two courses, reference is made to the remarks found under the head of Civil Engineering, page 59.

The elements of *Chemistry* in connection with the phenomena of heat, electricity and magnetism are taken up by lectures and recitations in the second semester of the Sophomore year. *Analytical Chemistry* is begun in the Junior year, and is kept up during two years. For further information upon this point see pages 78–80.

The course in *Mineralogy* and *Lithology* is made thorough and practical. The first subject in order is Crystallography which is fully illustrated by means of sciopticon projections and by a large collection of wooden models, with which each student will be obliged to make himself familiar. A set of over sixty glass models, imported from Germany, adds materially to the facilities of instruction in this branch of the subject. Following Crystallography, the other physical properties of minerals, such as hardness, lustre, diaphaneity, color, and structure, are taken up in turn, and the student is made familiar with their relative importance as means of identifying mineral species. Special descriptive Mineralogy comes next, and the more important species of minerals will be studied in detail, with constant reference to Dana's System of Mineralogy. Upon the completion of the descriptive portion of the subject, the study of Lithology is pursued in a similar manner, necessitating a constant application of the knowledge gained in the preceding part of the course.

The mineralogical cabinet contains about 8,000 specimens, embracing all the varieties of iron, copper, and silver ores and their associated minerals from the different localities of the Lake Superior mining district, as well as rare collections from other States and from foreign lands. In addition to the large cabinet, a working collection of nearly a thousand specimens of the more common minerals, ores, and rocks in all their varieties and groupings is freely accessible to the students for study and practice, under suitable restrictions to prevent any unnecessary damage to the specimens.

Upon the completion of the course in *Mineralogy and Lithology*, the subject of *Geology* is taken up and continued through the whole of the Senior year. The subject is taught by lectures, recitations, and the free use of the extensive geological collections belonging to the University. See pp. 13 and 14. Particular attention is paid to the geology of mines and mineral districts, and to the modes of occurrence of mineral substances which have an economical or commercial importance. Palæontology is taught so far as to enable the student to recognize the leading American fossils. The several State Geological Reports are referred to for details relating to the mineral wealth of the country, and the methods and objects of geological surveys will be explained.

In *Mining Engineering* the instruction is given mainly by lectures. The machines in use at the best mines are described, and the mutual relations of parts explained and illustrated with the aid of plates and diagrams; and the different operations connected with the discovery, opening, development, and working of mines are studied in their proper order. Models of mines and mining machinery will be accumulated as rapidly as circumstances admit. A very valuable model of a stamp mill has been given to the University by the Calumet and Hecla Mining Company.

The facilities for instruction in *Metallurgy* are of a very high grade. This branch is taken up in the Senior year, after a solid foundation has been laid by nearly two years of work in the Chemical Laboratory. Instruction is given by means of an extensive course of lectures and recitations upon the more theoretical aspects of the subject, and by a thorough drill in the fundamental principles upon which all successful smelting operations have to be conducted. A large and convenient Metallurgical Laboratory has been recently fitted up in connection with the Chemical Laboratory. It contains already a small Blake crusher, a California stamp mill with two stamps driven by steam power, four cupel furnaces, four large wind furnaces, a lathe, and a blacksmith's forge and anvil. Additional apparatus is to be procured before the end of the current year. A large quantity of ores and furnace products has been obtained from the Wyandotte Silver Smelting and Refining Company, and from Nevada, to which additions will be made from time to time. The ores of the Lake Superior region will always be fully represented. In this laboratory the subject of Assaying can be taught to great advantage.

The formation of a metallurgical and industrial cabinet will also be made an important duty in connection with this department. A model collection of iron ores and furnace products has been received for this collection from Cincinnati, and a set of over 250 specimens, illustrating the iron and copper industries of the Lake Superior region, has lately been sent from Philadelphia, being a part of what was displayed at the Centennial Exhibition. It is hoped that numerous contributions will be made to this cabinet from friends of the University and of this School.

ARCHITECTURE AND DESIGN.

The course in Architecture and Design is intended to impart the elements of a thorough architectural education, and to give a training which shall enable students after graduation to enter at once upon the duties of assistants in the offices of practicing architects and to profit by the experience they will there obtain.

To make the instruction as complete as possible, to illustrate it, and to fix the knowledge in the minds of the students, numerous projects or problems will be given out, such as will often actually occur; they will advance in importance and difficulty, from the more elementary to those which require high professional knowledge.

By the aid of instructors who, from experience, are familiar with the duties which an architect requires of his assistants, and who are in practice themselves, it is proposed to supply the wants and to impart the instruction which shall be of greatest benefit to the graduate and his employer.

The architectural schools of Europe and this country, and the united efforts of the great body of educated architects, through numerous periodical publications as well as by their professional works, have greatly improved the entire practice and standing of the profession, and extended its work. It is no longer possible to acquire in an architect's office, without previous systematic training, such an education as the present state of the profession demands. The office is a poor place in which to learn anything but the rudiments of practice; the principal has no time to devote to students, and they are forced to content themselves with learning to draw and acquiring some knowledge of building materials and architectural forms. Should they ever become successful practitioners, it is owing, except in rare instances, to capacity for business rather than professional skill.

The advantages of obtaining an architectural education in the region where the conditions of materials, construction and ways of working closely resemble those which are found where the graduate proposes to practice are very evident to all architects and builders. The prospect for a successful career to architects of advanced taste and skill was never more brilliant, especially in this part of the United States, where the difficulties of obtaining a professional education have been heretofore so great as to put it beyond the reach of many young men.

The requirements for admission are the same as those of the Scientific and Engineering Courses, and will be found in detail on page 34.

COURSE OF STUDY.

The following course of study is proposed for the coming year, subject, however, to such modification as experience may dictate. Technical branches are printed in SMALL CAPITALS.

FRESHMAN YEAR.

Mathematics.—Part III. of Olney's Geometry. Plane and Spherical Trigonometry. Part III. of Olney's Algebra, or an equivalent in other authors.

Chemistry.—Elementary Chemistry. Heat, Electricity, and Magnetism. Lectures.

GEOMETRICAL DRAWING.—Warren's Plane Projection Drawing. Use of India Ink and Water Colors. Ornamentation and Lettering.

French.—Translations from French into English, and from English into French. French Composition and Conversation.

DESIGN.—Free-hand Drawing and Elementary Architecture.

DESCRIPTIVE GEOMETRY.—Church's, and drawing of problems in Descriptive Geometry.

BOTANY.—Elements of Structural and Systematic Botany.

SOPHOMORE YEAR.

Physics (*Mechanics, Acoustics, and Optics*).—Deschanel's Textbook. Lectures.

Mathematics.—General Geometry and Calculus.

Rhetoric.—Lectures, with Day's Art of Discourse. Exercises in English Composition.

FREE-HAND DRAWING.—Sketching from nature. Application of natural forms to ornamentation. Pen and Ink Drawing. Water Colors.

ELEMENTARY ARCHITECTURE.—Shades and Shadows. Perspective. Stereotomy. Carpentry; stairs, etc.

JUNIOR YEAR.

ANALYTICAL MECHANICS—**SURVEYING.**—Use of instruments. Topography. One Plane Descriptive. Setting out work. Plane Table. Setting out Topographical Work—walks, drives, lakes, etc.

LANDSCAPE ARCHITECTURE.—Designs for private and public grounds, and the architectural details.

HISTORY OF ARCHITECTURE.—From the earliest period to the present date, illustrated by sketches, photographs, models, etc.

BUILDING MATERIALS.—The characteristics of the several kinds of Stone, Marble, and different Woods used in construction. The nature of Clay and Limestones, and the manufacture of brick, cement, lime, and terra cotta.

DETAILS OF BUILDINGS.—Masonry, Carpentry, Plastering, Plumbing, Gas-Fitting, Heating, Ventilation, Sewerage, etc.

DESIGN.—Projects of Buildings, beginning with the most simple, each project to be accompanied by a description in writing (specifications), and with a perspective drawing, in part in free hand, illustrating the general effect and details. Free-hand Drawings of Architectural Ornaments, of original design, and finished so as to be readily and unmistakeably understood by the mechanics who might be called to execute them.

SENIOR YEAR.

Engineering—Resistance of Materials. Foundations, Mechanism, etc.

THEORY OF ARCHITECTURE.—General considerations. Private and public buildings. House planning, hotels, churches, banks, offices, etc. Household Decorations—furniture, carpets, paper hangings, fresco, etc.

DESIGN.—Projects of important buildings. Preliminary studies, consisting of plans, elevations, and a perspective sketch will be prepared by the student, submitted and discussed, and after approval by the professor, working drawings will be prepared, showing plans, elevations, sections, details, calculations, specifications, estimates, etc., such as an architect in practice would furnish his client or the builders. Designs (original) of household decorations in pencil, ink, or color, such as furniture, fresco, internal finish, etc.

Possibly some other elective study may be taken in this year.

The regular candidates for a degree are required to submit at the end of the Senior year, original designs for an important edifice, consisting of plans, elevations, large perspective in ink-line or color, and effective drawings of important details. These drawings will be the property of the University.

MECHANICAL ENGINEERING.

While no course of instruction looking to this profession has been established, the greater part of the studies prescribed for the students in Civil Engineering will be found needful by those students in Selected Studies who may wish to devote especial attention to this branch. In the Senior year, the instruction more akin to Mechanical Engineering is: Pure Mechanism, or the General Principles of Machinery, including Gearing, Cams, Screws, Cranks and Levers, with Problems and Machine Drawing; also, Lectures upon the Prime Movers, Water Wheels and the Steam Engine. This work may be taken by students in Selected Studies, one year earlier, in place of Surveying, and in the next year they can take up Rankine's "Machinery and Millwork," and Rankine's "Steam Engine and other Prime Movers," a more extended course than is pursued by the other classes. They may also have practice in the Chemical Laboratory, in Qualitative and Quantitative Analysis, with special reference to the Metallurgy of Iron and Steel.

III. SPECIAL AND ADVANCED COURSES IN SCIENCE.

I.—MINERALOGY AND GEOLOGY.

The *general* course in these sciences covers nearly two semesters, during which the students attend the same exercises as those of the Classical and Scientific courses, with the addition of special practice hours.

Advanced students, or those who have completed the *general* course, will be furnished with the requisite facilities for a further prosecution of their studies in connection with the special course in Palaeontology or with the classes in the School of Mines.

II.—ZOOLOGY AND BOTANY.

Special courses in *Zoölogy and Botany* continue through the academic year. These courses are so divided that the work of either semester may be omitted without especial detriment to that of the other. Wherever practicable, however, the student is advised to take the two courses together, and to prepare for them by taking the preliminary courses of the academic classes.

The special course in *Zoölogy* for the first semester consists of the study of *Comparative Anatomy and Physiology*. Chauveau's "Anatomy of the Domesticated Animals," Marey's "Animal Machine," Gray's "Human Anatomy," Carpenter's "Comparative Physiology," and Carpenter's "Mental Physiology" are the books of reference for this course.

The work consists of the examination of specimens, dissections, and the use of instruments, accompanied by about thirty lectures. In the practical work the skeleton, muscles and principal viscera are studied. The lectures include the topics of the tegumentary system, bone, skeleton, muscle, locomotion, nervous system, innervation and the special senses. The student is required to make his dissections and demonstrations for himself. A course in human anatomy may form a practical part of thé work when desired.

In the second semester is given a course in *Systematic Zoölogy.* The principles of classification are given in a course of familiar lectures, and the student is taught to recognize the order of most animals at sight. A single branch of the subject, ornithology for example, is then taken up and pursued in more detail.

The special course in *Botany* for the first semester, is a course for the study of *Cryptogamic Plants* by alternating lectures and the analysis of species, with observations of their anatomy and physiology. Sachs' "Text-book of Botany," Le Maout and Decaisne's "Botany," Hooker and Baker's "Synopsis Filicum," Sullivant's "Icones Muscorum," an edition of Gray's Manual of Botany containing the Mosses and Hepaticæ, Cooke's "Fungi" and Cooke's "Hand-book of the British Fungi," are the most important books of reference for this course.

In the second semester *Structural and Physiological Botany* will be continued to the end of the year. The practical work will consist of, 1st, The microscopical examination of plant tissues illustrated by drawings and descriptions, and tested by the identification of unknown vegetable substances in powder; 2d, Investigation of the physiological data for plants, by means of instruments made for the purpose. This part of the course will be enlarged as rapidly as the necessary instruments can be provided. The practical work will be accompanied by lectures and recitations. The books of reference are Sachs' "Text-book of Botany," and "Handbuch der Experimental-Physiologie," Johnson's "How Crops Feed" and "How Crops Grow," Harrington's "Microscopical Examination of Crude Drugs and other Vegetable Products," and Schacht's "Mikroskop und seine Anwendung."

These courses will be made as practical as possible. For this purpose the student will be expected to apply for a table in the MICROSCOPICAL LABORATORY, where all the necessary materials, microscopes and other instruments, will be provided at a cost only sufficient to cover actual expense on the part of the University. The amount of cost will depend on the care and economy practiced by the student.

The Microscopical Laboratory is now so well supplied with instruments that it can respond to any moderate demand made on its resources. Students in Biology, Embryology, Structural, Physiological and Cryptogamic Botany, and, to a slight extent, those in advanced

Zoölogy perform a part of this work here. Instruction is given in Practical Microscopy, the use of micro-chemical reagents and other methods of observation, in drawing and measuring from the microscope, etc. Hereafter the instruments and other means for the investigation of Physiology, especially that of plants, will be added as rapidly as possible. These will be placed in the hands of the student, who will be expected to obtain the physiological data for himself. The Microscopical Laboratory is open from 8¼ to 12½ o'clock as many mornings in the week as the work of the classes requires. A charge is made of 50 cents per month for the use of each microscope. A corresponding charge is made for the other instruments and materials used by the students, when the University provides them. The student is required to make a deposit of two dollars with the Steward of the University before his application for a table can be entered. Students are responsible for the apparatus furnished them, and are required to make good any injury to the instruments under their charge.

The best text-books on the microscope and its use are as follows:

General—Carpenter's "Microscope," Beale's "How to Work the Microscope," the "Microscopic Dictionary."

Animal Histology, (mostly human)—Frey's "Microscope and Microscopical Technology," Stricker's "Manual of Histology," Kölliker's "Histology," Sanderson's "Hand-book of the Physiological Laboratory."

Botanical—Schacht, "Mikroskop und seine Anwendung," Van Heurck's "Microscope et son application aux études d'anatomie végétale," Flückiger & Hanbury's "Pharmacographia," Vogl's "Nahrungs und Genuss-mittel," etc.

The Botanical Course in the School of Pharmacy is described on pages 81 and 82.

The University possesses ample means for the illustration of the courses in Mineralogy, Geology, Zoölogy and Botany, in the large collections in the Museum, microscopes, and rooms specially adapted to this work. For aid in the course in Comparative Anatomy and Physiology, a fine set of typical skeletons has recently been procured.

III.—PHYSICS.

Instruction is given both by text-books and lectures in Mechanics of solids, liquids and gases, and in Acoustics and Optics. The subjects are treated both experimentally and theoretically. The Mechanics in the first part of the course serves as a preparation for the study of General Physics, and also as an introduction to the further study of Theoretical and Applied Mechanics.

The amount of physical apparatus, which has been largely increased and is still receiving additions, affords quite ample illustration in the course of instruction. The principles are required to be applied to the solution of problems, the data of which in some cases are obtained from class experiments. The graphical method is employed both to verify computations and to compare the results of observation with theory.

Students in Engineering, and others who elect, pursue a more thorough course in Theoretical Mechanics during the second semester.

Recognizing the fact that a thorough mastery of the physical sciences can be obtained only through the experimental method combined with mathematical analysis, we have reserved a large room, which will probably be provided soon with furniture and apparatus requisite for laboratory work. Students taking this part of the course will be furnished with a description of the apparatus and directions for using it. Experiments will be assigned to each person, and he will be required to take full notes of his observations and to deduce their results. The design is to make the student familiar not only with the facts and laws of the science, but with the methods and instruments of physical investigation, to give opportunity for extended study in any particular subject of Physics, and to stimulate to original research. It is expected, too, that facilities will be afforded for the construction or modification of the more simple apparatus, as need may arise in the course of experimentation.

IV.—PURE MATHEMATICS.

The description of the work in Pure Mathematics will be found on page 41.

V.—ASTRONOMY.

The Course in Higher Astronomy embraces two years, and begins with the first Semester of the Senior year.

The following subjects give direction to the lectures of the course:

Formation of the Fundamental Equations of Motion. Integration of the Equations for Undisturbed Motion, and Determination of the

Elements of the Orbit. Theory of Interpolation. Calculation of Ephemerides.

Calculation of the Orbits of the Celestial Bodies from Three or more Observations. Correction of the Elements. Combination of Observations by the method of Least Squares. Special and General Perturbations. Determination of Time, Latitude, and Longitude.

Theory of the Instruments.

During the course the student has access to the instruments of the Observatory, under the special direction of the Professor, and is permitted to take part in the observations.

VI.—MODERN LANGUAGES.

Large facilities are furnished for the study of the Modern Languages, with reference to the oral use of them, or to the reading of foreign treatises on Science. A detailed description of the work is found on page 39.

VII.—CHEMISTRY.

The preparations for giving instruction in General Chemistry, Chemical Physics, Analytical and Applied Chemistry, Metallurgy and Pharmacy are most ample and complete. The lecture-room in Chemical Physics and General Chemistry will accommodate nearly five hundred students, and is arranged with elevated seats, having special reference to experimental illustration. The lectures are illustrated by the use of a large collection of the most approved apparatus, covering the subjects of Heat, Spectrum Analysis, Electricity and General Chemistry. The use of the lantern, of the most approved construction, lighted by the calcium light or electric discharge, enables the Professor to exhibit delicate experiments upon the screen, so as to be seen by a large audience. These lectures are made as practical, in the ordinary affairs of life, as strict science will permit. The instruction in Metallurgy is illustrated by the use of a rare and expensive collection of furnace models constructed upon an accurate scale; embracing models for the smelting of Iron and Copper, Lead, Silver and Zinc, and for the manufacture of Steel and Glass.

The Laboratory of Analytical and Applied Chemistry is one of the largest in this country, occupying a ground space of 15,000 square feet. There are one hundred and seventy-five tables, adapted to the various courses. Each table is for the exclusive use of one student, and is supplied with gas, water, and wash basin and waste-pipe, as well as all the apparatus necessary for the laboratory work. Each student has an average area of fifty-five square feet, and an air space of eight hundred cubic feet. This laboratory is heated by steam, and furnished with six of the most approved sand, water and steam baths and drying ovens. The general furnace room (30 by 100 feet) is supplied with assay, blast and other metallurgic furnaces, and all the apparatus for organic analysis. The balance room is furnished with Oertling and Becker & Son's balances. In the Library room there will be found, for consultation, all the standard works on Chemistry and the allied sciences, as well as the leading European and American periodicals.

The whole Laboratory is ventilated by two large Sturtevant fan ventilators, propelled by steam power.

EXPENSES OF THE LABORATORY.—It is the design of the Regents that the chemicals and apparatus actually consumed in the individual manipulations of the student, shall be paid for by him. With this view the student on entering the Laboratory makes a deposit of ten dollars, a complete suit of apparatus is inventoried to him, and from time to time additional supplies are furnished. An accurate account is kept. On leaving the Laboratory he is credited with what may remain unconsumed, and the balance is struck. All supplies are furnished the student at the printed price current of New York dealers. The Laboratory expenses of students will vary with their prudence and economy. Experience has shown that the average is one dollar and ten cents per week for all Laboratory courses.

VIII.—ANALYTICAL AND APPLIED CHEMISTRY.

1. *Requirements for admission to the Laboratory.*—Before commencing work at his table, the student must be able to write the formulæ of salts. To do this, he must be prepared in the constitution of the acids and the quantivalence of the metals, and in the rules of combination. Miller's Introduction to Inorganic Chemistry is advised for this preparation, but any text-book of elementary chemistry (written in the modern notation), such as Roscoe's, may be used. The completion of Qualitative Analysis is a requisite for admission to any other course of laboratory work.

2. *Qualitative Analysis.*—(1) Study of the characteristics of the acids and bases in *known material.* This study is pursued by operations of analysis, as required in identifying and separating compounds;

operations of synthesis, showing the action of compounds upon each other; by use of the text-books of analysis and of general chemistry, for each acid and base; and by constructing statements of all chemical changes, in equations. When able to pass examination upon the means of identifying and separating each acid and base, and upon their incompatibilities with each other, and to write and explain the chemical equations (which must now be submitted with notes of the work in permanent form) the student is passed to the latter part of qualitative work. (2) *The analysis of Unknown Materials.* Each student receives a separate set, comprising sixty unknown mixtures (solids and solutions). After analysis of each five mixtures, the student reports his results. When the analyses have been all correctly reported, and the study of oxydizing and reducing agents is completed, the student receives the final qualitative examination. The text-book is Douglas and Prescott's Qualitative Analysis, and for general Chemistry, Bloxam's Chemistry, or Miller's Inorganic. Reference should be made to Storer's Dictionary of Solubilities, and Watts' Dictionary of Chemistry, in the library.

3. *Blow-Pipe Analysis.*—The determination of one hundred representative minerals, by qualitative blow-pipe analysis. Text-book, Brush's Manual, with the secondary use of Dana's Manual of Mineralogy and with reference to Dana's System. The last mentioned work is provided at the laboratory. Plattner's Manual (required for the work in Assaying) is a valuable work of reference in this course.

4. *Quantitative Analysis.*—(1) Determinations of Density of Solids and Liquids. (2) Gravimetric Determinations. (3.) Volumetric Determinations. (4) Gravimetric Separations. (5) Industrial and Commercial Analyses, comprising work upon the materials of that branch of applied chemistry chosen by the student, as follows: For Metallurgy and Mining,—ores, gangues, slags, fluxes, furnace materials, fuels, pig iron and steel, etc. For Manufactures,—the crude materials and raw and refined products of the chemical manufactures, paints, glass and pottery, cements, etc. For Agriculture,—fertilizers and ash of plants. The analysis of mineral and potable waters is included in this division. In the class-room, a study is made of quantitative determinations and separations, extending beyond those performed in the laboratory. Text-book: Fresenius' Quantitative Analysis, with references to the works of Storer, Thorpe, Noad, Crookes, Normandy, Rammelsberg and others, in the library.

5. *Assaying.*—(1) Practice in the *blow-pipe* assay of the precious metals, copper and lead, taken in alloy and in ore. Guide, Plattner's Manual of Qualitative and Quantitative Analysis with the blow-pipe. (2) *Volumetric* determinations of iron and silver,—following Fresenius.

(3) The *crucible* assay of the precious and base metals, from their ores. Mitchell's Assaying is the work most in requisition, for methods by crucible and scorification.

6. *For the Detection and Estimation of Impurities* in articles of commerce, the analyst requires training in Qualitative Analysis (2) Quantitative Analysis (4), Proximate Organic Analysis (Pharmacy 12) and in Pharmaceutical Botany and Microscopy (Pharmacy 7). With and after the work in Proximate Organic Analysis, there is practice in analyses of foods, condiments, alcoholic liquors, oils, soaps, medicinal mixtures, etc. The exercises in the recognition and estimation of impurities and substitutions embrace examinations of articles used in the various industrial arts and in the household, or brought in question in the service of hygiene. Lectures are given on these subjects, as explained under Pharmacy, 11 and 13. Besides the books elsewhere referred to, the recent works of Wanklyn (Milk, Tea, Coffee, Cocoa, etc.), Hager's Untersuchungen, and the (London) Pharmaceutical Journal for the last five years, are especially useful.

7. *Toxicology.*—Analyses of food material or tissue material in assumed cases of poisoning and in cases instituted with animals,—including the chief inorganic and organic poisons. Lectures and class-drills accompany the laboratory work. Reference is made to the works of Otto, Wormley, Reese, Taylor.

8. *Physiological and Pathological Analysis.*—Analyses of Urine, normal and abnormal, by qualitative, volumetric and microscopical methods. Examinations of tissue materials, excretions, blood-stains, etc. Reference to the works of Hassall, Beal, Carpenter, Burdon-Sanderson.

IV. SCHOOL OF PHARMACY.

It is the design of this department, which is now organized as a distinct school, to qualify its graduates to become practical pharmacists, general analysts, and chemical manufacturers, and to give them the training of systematic work in exact science. Class instruction is made to coöperate with laboratory practice in all the topics of the course. The class-work comprises both recitations and lectures,—none of which are repeated to the same students. The required laboratory work employs about four hours daily through the two collegiate years, each student advancing independently and receiving separate examination at the completion of each branch required.

It is REQUIRED FOR ADMISSION to the School of Pharmacy that the student possess a good knowledge of the use of the English language, as determined by written examination. The examination for admission will be held on the 29th day of September, at 9 A. M.

REQUIREMENTS IN THE FIRST YEAR.

1. *Chemical Physics and Inorganic Chemistry.*—In the First Semester *illustrated lectures*, three and four times a week; and *recitations* three times a week in the first six months, with the use of Miller's Chemical Physics and Inorganic Chemistry. The examination in chemical physics is held at the end of the first semester; in inorganic chemistry, just before the spring recess.

2. *Analytical Chemistry.*—Lectures and class-drills upon the laboratory work, and upon chemical problems, with recitations from the text-books in Qualitative, daily until the spring recess.

3. *Pharmacy.*—The study of pharmaceutical and manufacturing *operations*, by lectures and solution of problems, three times a week, from the holidays to the spring recess. Examination at the close of the course.

4. *Botany.*—Recitations with Gray's Lessons and practical studies with fresh plants (use of Gray's Manual) daily from the spring recess to the week before the June Commencement. Special attention is given to indigenous medicinal plants.

5. *Qualitative Analysis.*—Before commencing work at his table the student must be able to write the formulæ of salts. To do this, he must be prepared in the constitution of the acids and the quantivalence of the metals, and in the rules of combination. Attfield's Chemistry is advised for this preparation, but any text-book of elementary chemistry (written in the modern notation), such as Roscoe's or Miller's Introduction, may be used. The completion of Qualitative Analysis is a requisite for admission to any other course of chemical laboratory work.

Students not fully *prepared in chemical notation* are requested to present themselves at the laboratory class-room, one week before the opening of the term (Sept. 24, 1877, 3 P. M.), for daily exercises in this preparation.

The qualitative work is divided as follows: (1) Study of the characteristics of the acids and bases in *known material.* When able to pass examination upon the means of identifying and separating each acid and base, and to give the chemical equations, the student is passed to the latter part of qualitative work. (2) The *analysis of Unknown Materials.* Each student receives a separate set of unknown mixtures, (solids and solutions). After analysis of each five mixtures, the student reports his results. When the analyses have been all correctly reported, and the study of oxidizing and reducing agents is completed, the student receives the final qualitative examination. The text-book is Douglas and Prescott's Qualitative Analysis, and for general Chemistry, Miller's Inorganic. Reference is made to Storer's Dictionary of Solubilities, and Watts' Dictionary of Chemistry, in the library.

REQUIREMENTS IN THE SECOND YEAR.

7. *Pharmaceutical Botany.*—Exercises daily through the first semester, as follows: examination of fresh plants, continued for the first six or eight weeks. Then lectures and exercises on structural botany, with reference to the identification of drugs of vegetable origin and the detection of adulterations in foods, condiments and medicines. The lectures alternate with work in the Microscopical Laboratory, embracing a systematic course in examination of a series of commercial articles, with use of Harrington's Microscopical Examination of Crude Drugs and other Vegetable Products. Examination at the close of the first semester. Examination when concluded.

8. *Crystallography.*—Twelve to fifteen lectures on systematic crystallography with exercises in identifying crystals, in the first half of the first semester.

9. *Materia Medica.*—Lectures three times a week for four or five months. A collection of crude drugs and pharmacopœial preparations, in the chemical laboratory, is used by the class in study for the recitations. Text-book, Biddle. Examination, just before the spring recess.

10. *Organic Chemistry.*—Lectures on the rudimentary chemistry of carbon compounds. Foods, tissue substances, materials of industrial importance. *Toxicology* by lectures. From the beginning of the second semester to the spring recess, four times a week.

11. *Pharmacy.*—First, of *inorganic* materials and the technical history of chemical wares, by lectures and recitations, from works of reference and from laboratory work, until the Christmas vacation. Second, of *organic* chemistry and materials, lectures, and recitations from Proximate Organic Analysis, until the week before the June Commencement. For the first six months of the term, three times a week; for the last three months of the term, five times a week.

12. *Organic Analysis.*—(1) Ultimate Organic Analysis; (2) Verification of the reactions of carbon compounds in a series of known mixtures; (3) Qualitative Analysis of a series of organic mixtures; (4) Quantitative estimation of organic drugs. Text-book, Prescott's Proximate Organic Analysis.

13. *Commercial Examinations.*—The detection and estimation of impurities in articles important in commerce,—such as medicines (both authorized and proprietary), condiments and foods, pigments, detergents and chemicals used in the industrial arts—the examinations being chemical and microscopical, as required. The material will be separately assigned to each student. Students are invited to propose articles and to assist in collecting a sufficient number of samples. The work requires the use of all the text-books before mentioned, with reference to the works of Hassall, Wanklyn, Normandy, Fluckiger and Hanbury, and other authorities in the library.

14. *Toxicology.*—Analyses of food material or tissue material in assumed cases of poisoning and in cases instituted with animals,—including the chief inorganic and organic poisons. Lectures are given with the laboratory work. Reference is made to the works of Otto, Wormley, Reese, Taylor.

15. *Analysis of Urine.*—Normal and abnormal, by qualitative, volumetric and microscopical methods. Text-book, Harley. Reference to the works of Hassall, Beal, Carpenter, Burdon-Sanderson. The examination is held on eompletion of a course of lectures on this subject.

16. *Pharmacopœial Preparations.*—Exercises in each class, U. S. Pharmacopœia; in some of the more elaborate chemical productions; in the minor performances of extemporaneous pharmacy, and in reading and preparing prescriptions. Use of the U. S. Pharmacopœia with reference to the U. S. Dispensatory. The student derives advantage from ready access to Parrish's Pharmacy and to Wittstein's Pharmaceutical Chemistry.

17. *The Thesis* for the degree of Pharmaceutical Chemist is required to embody the results of investigation by the student under direction of the professor in charge of the subject chosen, which must be accepted by the Faculty as early as the first of April. The investigation may consist of examinations of articles in commerce or in nature, trials of methods of analysis, collections of natural articles, preparation or extraction of rare substances, improvement in methods of preparation, or personal research in *any subject of the course.* A careful comparison of authorities must first be made and references given.

The required *text-books* are named in connection with the work for which they are used, as are also some of the *works of reference* most frequently needful. Attfield's Chemistry may be used in preparation for the laboratory work, and is convenient through the course. Students are not required to provide themselves with the works of reference, many of which are furnished at the laboratories. Storer's

Dictionary of Solubilities and Watts' Dictionary of Chemistry should be very frequently consulted. The following works are also employed: Gmelin's Handbook of Chemistry; Bentley's Manual of Botany; Gray's Structural and Systematic Botany; Fresenius' Qualitative Analysis; Sutton's Volumetric Analysis; Storer's Cyclopœdia of Quantitative Analysis; Wittstein's Chemical Analysis of Plants; Wormley's Micro-chemistry of Poisons; Otto's Poisons; Hassall's Analysis of Urine; Beale's Works; Hoffman's Medicinal Chemicals; Hassall's Adulterations; Wanklyn's Tea, Coffee and Cocoa Analysis; Prescott's Examination of Alcoholic Liquors; Vogel's Nahrungs and Genussmittel; Hager's Untersuchungen; Heppe's Chemischen Reactionen; Wagner's Chemical Technology; Zeitschrift f. analyt. Chemie; Pharmaceutical Journal; Planchon's La determination des drogues vegetales; Fluckiger and Hanbury's Pharmacographia.

The collegiate year in this school commences October 1st, and closes at the June Commencement. Graduates receive the degree of Pharmaceutical Chemist. Concerning expenses of laboratory work, see page 78.

The order of exercises is given on the following page.

ORDER OF EXERCISES.

FIRST YEAR—First Semester.

Class Work.

Hours.		
9½ to 10½	Analytical Chemistry (2)*—twice a week—until the holidays. Pharmacy (3)—three times a week—from holidays to the close. Chem. Physics and Inorganic Chemistry (1) three times a week.	
8½ to 9½	Analytical Chemistry (2)—daily.	
5 to 6	Chemical Physics and Inorganic Chemistry (1)—three times a week.	

Laboratory Work.

1 to 5	Qualitative Analysis (5)—daily.	

Second Semester.

Class Work.

9½ to 10½	Quantitative Analysis (6)—three times a week—from the recess to close.	
10½ to 11½	Pharmacy (3)—three times a week—until recess. Botany (4)—five times a week—from the recess to the close,	

Laboratory Work.

1½ to 5½	Qualitative Analysis (5) (concluded). Quantitative Analysis (6)	daily.

SECOND YEAR—First Semester.

Class Work.

9½ to 10½ or ... or ...	Pharmaceutical Botany (7)—daily.	
10½ to 11½	Pharmacy (11)—three times a week. Crystallography (8)—twelve or fifteen lectures.	
11½ to 12½	Quantitative Analysis (6)—three times a week—to holidays.	
5 to 6 or ... or ...	Materia Medica Lectures (9)—three times a week—for four months.	

Laboratory Work.

1 to 5	Microscopic Analysis (7) Toxicology (14). Anal. Urine (15) Pharmaceutical Preparations (16)	daily.

Second Semester.

Class Work.

9½ to 10½	to recess	Pharmacy (11)	three times a week—to recess.
9½ to 12½	after recess		daily, after recess.
10½ to 11½	Toxicology (14)—three times a week Anal. Urine (15)—twice a week		after the recess.

Laboratory Work.

1½ to 5½	Organic Analysis (12) Original work (13, 17)	daily.

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* The figures in parentheses refer to the numbering of the subjects given in the preceding pages.

THE FACULTY

OF

THE POLYTECHNIC SCHOOL.

JAMES B. ANGELL, LL. D.,
PRESIDENT.

SILAS H. DOUGLAS, M. A., M. D.,
JAMES C. WATSON, PH. D.,
EDWARD OLNEY, LL. D.,
ALBERT B. PRESCOTT, M. D.,
GEORGE S. MORRIS, M. A.,
CHARLES E. GREENE, M. A., C. E.,
GEORGE E. FROTHINGHAM, M. D.,
MOSES COIT TYLER, LL. D.,
WILLIAM H. PETTEE, M. A.,
JOHN W. LANGLEY, S. B.,
W. L. B. JENNEY, C. E.,
JOSEPH B. DAVIS, C. E.,
MARK W. HARRINGTON, M. A.,
WOOSTER W. BEMAN, M. A.,
JOSEPH B. STEERE, PH. D.,
ISAAC N. DEMMON, M. A.,
P. R. B. DEPONT, B. A., B. S.,
CHARLES S. DENISON, C. E., M. S.,
ALFRED HENNEQUIN, M. A.,
CHARLES N. JONES, B. A.,
OTIS C. JOHNSON, B. A., PH. C.,
SAMUEL T. DOUGLAS, PH. B., PH. C.,
ABRAM V. E. YOUNG, PH. B., PH. C.,
VICTOR C. VAUGHAN, PH. D.,
HENRY B. PARSONS, PH. C.

STUDENTS.

CIVIL ENGINEERING.

SENIORS.

Name.	Residence.
Osmer Henry Aikine,	*Jackson.*
Holland William Baker,	*St. Joseph.*
Edward Johnson Snover,	*Romeo.*

JUNIORS.

Name.	Residence.
George Franklin Allmendinger,	*Ann Arbor.*
Clarence Oliver Arey,	*Whitewater, Wis.*
Dennis James Casey,	*Wilmington, Del.*
Timothy Josenhans,	*York.*
Benjamin Austin Richards,	*Chicago, Ill.*
James Sanderson,	*Detroit.*
Frank Leonard Sizer,	*Ottawa, Ill.*
Hiram Everett Terry,	*Avon.*
James Edgar Turtle,	*Cheshire, Mass.*
Andrew Wenzell,	*Detroit.*

SOPHOMORES.

Name.	Residence.
Theodore Melzo Bates,	*East Cleveland, Ohio.*
Joseph Allan Beaumont,	*Peru, Ind.*
Edward Sweatt Davis,	*Waxahachie, Texas.*
Isaac Channing Goff,	*Cleveland, Ohio.*
Charles Sumner Henning,	*Plano, Ill.*
Cicero Demerit Hill,	*Milwaukee, Wis.*
Irving K. Pond,	*Ann Arbor.*
Evert Van Pelt,	*Buffalo, N. Y.*
E. Fred Wood,	*Ann Arbor.*

FRESHMEN.

Name.	Residence.
John Ayers,	*Fort Smith, Ark.*
Andrew Strong Deacon,	*Harrisonville, Mo.*
Frank Merrill Dunlap,	*Detroit.*
Brayton Daniel King,	*Ann Arbor.*
Edward Bowen Lewis,	*Ionia.*
Duncan Wolcott Miller,	*Bowne.*
Fred Polhemus,	*Ann Arbor.*
Frank Satterlee,	*Birmingham.*
John Charles Waterman,	*Grand Rapids.*

SELECT STUDIES.

Name.	Residence.
Theodore S. McCoy,	*Van Wert, Ohio.*

MINING ENGINEERING.

RESIDENT GRADUATES.

Name.	Residence.
Frank Ward Fletcher, PH. B.,	*Detroit.*
Albro D. Morrill, B. S.,	*Tilton, N. H.*

JUNIORS.

Name.	Residence.
Walter Scott Abell,	*San Francisco, Cal.*
Henry Wick Judd,	*Flint.*
Eugene George Mann,	*Ann Arbor.*
Sydney Buckminster Wight,	*Detroit.*

SOPHOMORES.

Name.	Residence.
Frank Voorhees Luse,	*Louisville, Ky.*
H. Throop Morley,	*Marine City.*
Thomas Henry Noble,	*Elk Rapids.*
Henry Camp Post,	*Grand Rapids.*
John Charles Quintus,	*Grand Rapids.*

FRESHMEN.

Name.	Residence.
Samuel Lloyd Beaumont,	*Ann Arbor.*
Frank Wood Loveland,	*Golden, Colorado.*
Joseph Henry Matthews,	*Canton, Ohio.*
William Wallace Nash,	*Ottawa, Ill.*
Charles Evart Paddock,	*Grand Rapids.*
Charles Chase Whitacre,	*Chicago, Ill.*

SELECT COURSE.

Name.	Residence.
Edward James Bird,	*Bay View, Wis.*

ARCHITECTURE.

JUNIORS.

Name.	Residence.
George Lee Fisher,	*Pontiac.*
John Butler Johnson,	*Kokomo, Ind.*
Seymour Tenny Morse,	*Highland.*
William Augustus Otis,	*Ann Arbor.*
Ossian Cole Simonds,	*Grand Rapids.*

ADVANCED ZOÖLOGY AND BOTANY.

RESIDENT GRADUATES.

Name.	Residence.
Abram Sager Hall, Ph. B.,	*Saline.*
Louisa Maria Reed, B. S.,	*Ann Arbor.*

SELECT COURSE.

Name.	Residence.
William Gray Lapham,	*Northville.*
Alice Emeline Tracy,	*Platteville, Wis.*

ADVANCED ANALYTICAL CHEMISTRY.

Name.	Residence.
Charles McKinstry VanCleve, B. A.,	*Ypsilanti.*

THE FACULTY

OF

THE SCHOOL OF PHARMACY.

JAMES B. ANGELL, LL. D.,

PRESIDENT.

SILAS H. DOUGLAS, M. A., M. D.,

ALBERT B. PRESCOTT, M. D.,

DEAN.

GEORGE E. FROTHINGHAM, M. D.,

WILLIAM H. PETTEE, M. A.,

JOHN W. LANGLEY, S. B.,

MARK W. HARRINGTON, M. A.,

VOLNEY M. SPAULDING, M. A.,

OTIS C. JOHNSON, B. A., PH. C.,

SAMUEL T. DOUGLAS, PH. B., PH. C.,

ABRAM V. E. YOUNG, PH. B., PH. C.,

VICTOR C. VAUGHAN, PH. D.,

HENRY B. PARSONS, PH. C.,

STUDENTS.

SECOND YEAR.

Name.	Residence.
James Lowell Anderson,	*Ann Arbor.*
Lynn D. Arnold,	*Corry, Pa.*
John Herbert Avery,	*Detroit.*
Gleason Fillmore Dixon,	*Ann Arbor.*
William Howard Gates,	*Clinton Junction, Wis.*
Will Frank Griffith,	*Howell.*
Albert Adam Hallock,	*Ann Arbor.*
Bagley A. Harris,	*Pontiac.*
Theodore Hauck,	*Ottawa, Ohio.*
Frank Jackson Hubbard,	*Galesburg.*
Kent P. Humiston,	*Morenci.*
Marion Eliza Johnson,	*New York, N. Y.*
John Sleeper Johnson,	*Fenton.*
Joseph John Johnston,	*Westfield, N. Y.*
Abram Pitcher Kerley,	*Upper Red Hook, N. Y.*
David Kirk,	*Kirkton, Ontario.*
Victor Knapp,	*Boonville, Ind.*
William Herbert Denston Lewis,	*Chicago, Ill.*
Arthur Stephen Lobb,	*Monroe.*
William Lester Long,	*New Haven, Ohio.*
Stanley Eli Parkill,	*Owosso.*
Mary Elizabeth Post,	*Rochester, N. Y.*
Elwood Morris Reed,	*New Richmond, Ohio.*
J. Hungerford Smith,	*Richville, N. Y.*
Ransom H. Stevens,	*Grand Rapids.*
Clarence George Stone,	*Detroit.*
J. Warren Tompkins,	*Red Hook, N. Y.*
Hugh Sumner Wyman,	*Blissfield.*
Arthur Lansing Young,	*Ann Arbor.*

FIRST YEAR.

Name.	Residence.
Frank Atwood Brooks,	*Goliad, Texas.*
William John Brown,	*Newburg, N. Y.*
Henry Herbert Bucknum,	*Parma.*

Hulett White Calkins,	*South Lyon.*
Truman Chittenden,	*Berlin, Wis.*
William A. Clark,	*Blissfield.*
Will E. Finley,	*Hastings.*
Elbridge Dayton Gibson,	*Pontiac.*
John E. Gregory,	*Howell.*
Frank Leslie Hall,	*Mannsville, N. Y.*
Will Henry Hardy,	*Massillon, Ohio.*
Will Andrus Hasbrouck,	*Battle Creek.*
Henry Heim,	*East Saginaw.*
Cyrus Wellard Heister,	*West Lebanon, Ohio.*
William Kerr Higley,	*Ann Arbor.*
Oscar Herman Koehnle,	*Lincoln, Ill.*
Hugo Lorens Lupinski,	*Sheboygan, Wis.*
William Stewart McCay,	*Grand Rapids.*
Albert McMurphy,	*Port Byron, Ill.*
Henry L. W. Meyer,	*Fort Wayne, Ind.*
Theodore Fred Meyer,	*St. Louis, Mo.*
John Johnston Miller,	*Knoxville, Ill.*
Lucius Wright Moody,	*Ogdensburg, N. Y.*
Erwin Riley Morey,	*Beekman, N. Y.*
Henry Ebenezer Prindle,	*Hastings.*
Louis Ernest Seyffardt,	*Saginaw.*
Amasa D. Smith,	*Pewamo.*
Ellery Spencer,	*Lenox, Mass.*
Henry Stecher,	*Sheboygan, Wis.*
Hugo Thum,	*Grand Rapids.*
Perry Leland Townsend,	*Ann Arbor.*
Robert Henry Wallace,	*Lexington.*
Rollin Edwin Wick,	*Coleta, Ill.*
George E. Wilson,	*Napoleon, Ohio.*
Clinton Edwin Worden,	*Ann Arbor.*

DEPARTMENT
OF
MEDICINE AND SURGERY.

I. THE LECTURE COURSE.

The 28th annual course of lectures will commence on Monday, October 1, 1877, and will continue until the last Wednesday in March, 1878, with a recess during the holidays. Four lectures are delivered daily. Previous to each lecture students are examined, in accordance with a by-law of the Board of Regents, on the subjects of the preceding lectures. Clinics are held every Wednesday and Saturday for both medical and surgical cases, at which time examinations are made, prescriptions given and surgical operations performed, gratuitously to patients, in the presence of the class.

II. TERMS OF ADMISSION.

Every candidate for admission to the Medical Department must be eighteen years of age, and must present to the Faculty satisfactory evidence of a good moral character. Unless already a matriculant of the University or a graduate of some respectable college, academy or high school, every candidate shall be examined as to his previous education and his fitness for entering upon and appreciating the technical study of medicine. The diploma or certificate of graduation from such institutions must be presented to the Dean of the Faculty by the candidate in order to secure exemption from the examination, which wlll be in writing and will cover the ordinary branches of an English education. This examination is not yet so exacting in its demands as we hope to be able to make it before long, but it is intended to test the student's acquaintance with the fundamental branches of an English education and his general intelligence and capacity to appreciate and profit by professional instruction.

Examinations will be held at 2 P. M., on Friday and Saturday, September 28 and 29, 1877. Candidates are required to present themselves on one of these days, as they are expected to be in attendance upon the first day of the term, at which time the regular course of instruction will commence. To provide for cases in which it is absolutely impossible for the candidate to be present at this time, supplementary examinations will be held at such times as may be determined upon by the Faculty, but no excuse except of an urgent character will be accepted for failure to appear at the first examination. Certificates of attendance are given for the actual period of attendance only.

Before admission to examination every student is required to present to the Dean of the Faculty the Steward's receipt for the payment of the matriculation fees and annual dues. It will therefore be necessary for the candidate to apply first to the Steward at his office in the University Hall, register his name as a student in the department of medicine and surgery, and pay his fees. In case of rejection the moneys paid preliminary to examination will be refunded by the Steward.

III. ADMISSION OF WOMEN.

Recognizing the equality of rights of both sexes to the highest educational advantages, the Board of Regents, a few years since, made provision for the medical education of women, and they are now admitted to this as to all departments of the University on the same conditions that are required of the men. It is proper to state, however, in answer to the numerous inquiries which are made on this point, that the course of instruction for women, though equal in all respects to that provided for the men, is given separately, the two classes not being brought together in the lecture rooms except in the department of general chemistry. Ample provision has been made for the women's classes in the way of lecture rooms, dissecting rooms, etc.

IV. CONDITIONS OF GRADUATION.

Each candidate proposing to graduate at the close of his second course, must announce his intention at the beginning of that course, in order to receive those repeated examinations necessary to attest his qualifications.

To be admitted to the degree of Doctor of Medicine, the student must exhibit evidence of having pursued the study of medicine and surgery for the term of three years with some respectable practitioner of medicine (including lecture terms); must have attended two full courses of didactic instruction, the last of which must have been in the College of Medicine and Surgery in the University of Michigan, and the other in this or some other reputable medical institution; must have been engaged in the study of Practical Anatomy and Practical Chemistry; must be twenty-one years of age; must have submitted to the Faculty a thesis, composed and written by himself, on some medical topic, and have passed an examination, at the close of the term, satisfactory to the Faculty. He is also required during the course to submit to written examinations by each Professor, on some subjects pertaining to his department, in order to test further his knowledge of such subjects, and his ability to express himself correctly in writing. The final thesis may be written in English, German, French or Latin, and, if required, must be defended before the Faculty. The theses of successful candidates are to be preserved among the archives of the college. The theses of rejected applicants are returned.

V. EXTENDED COURSES.

The curriculum of medical studies, ever enlarging with the advancement of science, has become so much extended that the time usually spent in American medical colleges, always too short, is now entirely inadequate to that full, thorough and repeated presentation of the subjects required in a proper medical education. Although from the origin of this department its courses of instruction have been longer than those of other medical schools in this country, yet the time demanded is not sufficient for accomplishing for the students all that is desired; and though the anthorities of the University do not require any extension of the time of attendance, yet the Faculty earnestly advise that students enter the college early in their course of study and remain in attendance for *three* terms instead of two, as is so generally the custom.

They would further advise that those who may take this more extended and thorough course devote the first year chiefly to the elementary branches of Chemistry, Anatomy, Physiology and Materia Medica; the second year to carefully reviewing these subjects in connection with the thorough study of the more advanced branches of Pathology and the Practice of Medicine, of Surgery, of Midwifery and the diseases of women and children, and of the specialty of diseases of the eye and ear; while the third year should be chiefly devoted to a careful review of these latter branches, and to clinical study in the hospital.

In order to encourage students to take the extended course, the authorities have decided that those who elect it, may pass their full examinations in Anatomy, Physiology, Chemistry and Materia Medica at the end of the second college year, and receive a certificate to that effect, without reference to their time of study, and may thus be left free to give more thorough attention to the practical and more special branches the third year, and to prepare for the final examination upon them, admitting to the degree of Doctor of Medicine.

Students will find additional inducements to take the three years' course, in the facilities which will be afforded them during the third year to study in sections under the instruction of the professors, the details of diagnosis and treatment at the bed-side, in the new State hopital, during the time out of the regular lecture hours, which must necessarily be spent by first and second course students in the chemical, anatomical and physiological laboratories.

Attendance during the first year upon the lectures on the advanced branches of Practice of Medicine, Surgery and Obstetrics, and during the third year in the primary branches of Chemistry, Anatomy, Physiology and Materia Medica, will be optional with students taking the three years' course—attendance upon two courses only in each of the branches being required.

During the three months succeeding the regular lecture term, the chemical laboratory is open and all the means of instruction are available, as at any time; and facilities for pursuing other special studies, such as Botany, Zoölogy, etc., are afforded to those interested in these subjects. The Faculty strongly advise that as much of the practical work in the laboratories as possible be done at this time, when fewer subjects are pressed upon the attention of students. Thus a nine months' course, without additional fees, is offered to all.

The advantages of combining a graded or successive, with a repeating course of instruction, extended over so long a period and at so little expense, are too obvious to require further mention.

To encourage a higher grade of preliminary acquirements, an allowance of six months from the term of study is made in favor of graduates of the College of Arts and Science in the University, and of other respectable literary colleges, in evidence of which a diploma must be exhibited.

Also an allowance of twelve months is made for graduates of the Department of Pharmacy in this University.

The week preceding Commencement will be devoted to the examination of candidates.

VI. FACILITIES FOR INSTRUCTION.

The department of Medicine and Surgery is abundantly supplied with plates, photographs, models, specimens, preparations, apparatus and instruments, for the purpose of illustrating the different studies embraced in the course. The apparatus in the department of chemistry and chemical physics, is probably unsurpassed, if indeed it be equaled, by that of any medical college in the country. Additions are made from time to time to these collections by special appropriations from the Board of Regents so that the Faculty are enabled to adopt every new method of illustration and to exhibit to the classes each year all important improvements in the way of instruments and apparatus that are employed in the practice of medicine and surgery, and to show their application.

The museums of Professors Ford and Sager, embracing several thousand specimens, which are the result of many years' labor in the collection and preparation of materials intended to aid directly in teaching, have now become the property of the University, and are used in the daily work of the class rooms. These museums contain a valuable collection of bones, illustrating healthy as well as diseased conditions, and showing the various changes that occur from infancy to old age, and the processes of first and second dentition ; dissections, general and partial, of the vascular, nervous and muscular systems, both normal and abnormal ; models in wax, papier maché and plaster of various portions of the body, illustrating morbid growths, skin diseases, etc. ; preparations in the comparative embryology, neurology and craniology of the vertebrata ; human embryology and anatomy and pathology of the diseases of women, etc. The collection of monstrosities, both single and double, of man and the lower animals is unusually full and valuable.

The department of the museum illustrative of Materia Medica consists of a very complete suit of crude organic medicinal substances, embracing between five and six hundred specimens, imported from Paris, put up in beautiful glass-covered half gallon jars of uniform appearance, finely displayed and arranged according to their order in natural history; beside about one thousand other specimens of simple mineral and vegetable substances, and pharmaceutical and officinal preparations, active principles, etc., arranged in groups convenient for study. Medical botany is further illustrated by between one and two hundred large and finely colored plates.

The above collections, to which additions are made yearly, are catalogued and arranged in cases. The museum thus affords a secure depository for objects of interest and value, and it is to be hoped that the alumni and other friends of the University will continue their generous donations of such materials.

Besides these aids in study the students in medicine are allowed free access to the general botanical, zoölogical and geological cabinets of the University, which are estimated to contain 150,000 specimens. The scientific and philosophical lectures collateral to medicine, which are given in the collegiate department, are also open to our students. The general library contains about 23,500 volumes, of which some 1,600 are medical works. A complete catalogue of the library, arranged both by the names of authors and by subjects, is accessible to all students. The leading medical periodicals of this country and of Europe are taken and kept on file in the library.

Arrangements have been made by which an ample supply of material for the purpose of practical anatomy has been secured, and special attention is given to this important study. Material for this department can be furnished as abundantly and at as low rates as at other institutions of the kind.

The chemical laboratory is one of the largest and best equipped in the United States, occupying a ground space of 15,000 square feet, and containing 175 tables, each being supplied with gas and water, and all the apparatus necessary for laboratory work; and every student before he can receive the degree of M. D., is required to take a course of practical medical chemistry, which comprises, according to the expertness of the student, from ten to sixteen weeks of laboratory work. In this course is included Qualitative Analysis, first of *known* and afterwards of *unknown materials ;* Toxicology,—analysis of food or tissue materials in assumed cases of poisoning, and in cases instituted with animals,—including the chief inorganic and organic poisons; Physiological and Pathological Analysis,—including analysis of Urine, normal and abnormal, by qualitative, volumetric and microscopical methods, and the examination of tissue materials, excretions, bloodstains, etc. Lectures and class-drills accompany this laboratory work, and reference is made to the works of Otto, Wormley, Ruse, Taylor, Hassell, Beal, Carpenter, and Burdon-Sanderson. The only expense incurred in the laboratory is the actual cost of the chemicals and apparatus consumed by the student in his manipulations. Experience has shown that the average is one dollar and ten cents per week for all laboratory courses.

During the current year a Histological and Physiological Laboratory has been organized by the Professor of Anatomy, with the coöperation of the Professor of Physiology, and with competent assistance. To this upon payment of a moderate fee, will be admitted a limited number of students who may desire to learn the methods of microscopic and physiological research.

While all students in the department are admitted to this laboratory, the Faculty would suggest to those who may desire to enter it, that it would be very helpful to them to make themselves familiar before admission to the medical school with the general facts of Biology and of Physiology, by such dissections and experiments as are described in the little manuals of Huxley & Martin, and of Foster and Langley. Instruction in these topics is given in the Department of Literature, Science, and the Arts, in this and some other universities.

Recognizing the importance of combining clinical with didactic instruction, College Clinics have for years past been conducted on Wednesdays and Saturdays during the session, for Medical, Surgical and Ophthalmic patients. These are examined, prescribed for, and when necessary, operated upon before the class ; and large numbers, especially of chronic cases, from this and neighboring States, have availed themselves of these privileges. Besides this, the Regents, some years since, set apart one of the University buildings for hospital purposes, where considerable numbers of patients have been treated. Still our hospital facilities have hitherto been wholly inadequate; but at the last session of the Legislature of this State, a generous grant of money (to which a large amount has been added by the city of Ann Arbor) was made for the purpose of erecting and furnishing a new hospital. Two pavilions attached to the older building, (which will hereafter be used exclusively for the executive department of the hospital,) have been erected. These pavilions are each one hundred and fifteen feet long by twenty-eight feet wide, with seventeen feet ceilings, and are amply provided with every appointment of a first-class hospital—baths, water closets, heating and ventilating apparatus, lounging and reception rooms for patients, etc. A few private rooms have been provided for such patients as may be willing to pay an increased price for better accommodations than are furnished in the general wards. Patients are required to pay only the cost of board and medicines, the medical and surgical attendance being gratuitous. The buildings will hereafter be kept ready for occupation, and it is believed that the supply of clinical material will be as great as can be fully utilized in illustrating the didactic course. Patients will be received from any State, the only restriction being that no contagious diseases are admitted.

A special course of instruction in Physical Diagnosis is given by the Professor of the Practice of Medicine, for which a fee of five dollars extra is required. Attendance on this course is optional with the students.

VII. FEES AND EXPENSES.

The fees, which must be paid in advance, are as follows:

Matriculation Fee.—Residents of Michigan, $10; non-residents, $25.

Annual Dues.—Residents of Michigan, $15; non-residents, $20.

Graduation Fee.—For all alike, $5.

For further particulars concerning expenses, see page 22.

VIII. TEXT AND REFERENCE BOOKS.

Any of the following text-books in each department will answer the necessities of the student; and wherever a preference exists it is given to those first in order on the list.

ANATOMY. -Gray, Quain, Wilson, Leidy, Peaslee, Stricker.

PHYSIOLOGY.—Dalton, Flint (one volume edition), Küss, Marshall, Kirkes. For reference, Flint (five volume edition), Stricker, Sandersons's Hand-book for the physiological laboratory, Foster and Langley's Practical Physiology, Huxley and Martin's Biology.

CHEMISTRY AND PHARMACY.—Miller's Chemical Physics, Bloxam's Chemistry, Miller's Inorganic, Douglas and Prescott's Analysis, Harley on the Urine, Wormley's Micro-chemistry of Poisons.

MATERIA MEDICA AND THERAPEUTICS.—H. C. Wood, Jr., Stillé, Waring, Ringer, Biddle. *Special Subjects*—Headland on the Action of Medicines, Anstie on Stimulants and Narcotics, Harley on the Old Vegetable Neurotics.

PATHOLOGY AND PATHOLOGICAL ANATOMY.—Wagner, Green, Rindfleisch, Billroth, Paget, Williams's Principles. *For Reference*—Rokitansky and Virchow.

OBSTETRICS.—Meadows, Leishman, Tyler Smith, Byford, Milne, Schrœder, Cazeaux, Hodge. *Special Subjects*—Tanner on Pregnancy, Barnes on Obstetric Operations, Elliot's Obstetric Clinic, Barker on the Puerperal Diseases.

DISEASES OF WOMEN.—Thomas, Byford, Hewitt, West, Barnes, Hodge. *Special Subjects*—Tilt, Uterine Therapeutics ; Klob, Pathological Anatomy of the Female Sexual Organs ; Peaslee on Ovariotomy ; Sims on Uterine Surgery ; Emmet on Vesico-Vaginal Fistula.

DISEASES OF CHILDREN.—J. L. Smith, Vogel, Tanner, Meigs anp Pepper. *Special Subjects*—Eustace Smith on the Wasting Diseases of Infancy and Childhood, Combe on the Management of Infancy, Routh on Infant Feeding, Holmes or Guersant on the Surgical Diseases of Children.

PRACTICE OF MEDICINE.—Aitkin edited by Clymer, Niemeyer, Roberts, Flint, Watson, Tanner, Wood. *Special Subjects.*—Walshe or Flint on the Lungs, Williams on Pulmonary Consumption, Flint or Stokes on the Heart, Roberts or Beale on Urinary Diseases, Budd on the Stomach, Chambers on the Indigestions, Murchison on Fevers, Murchison on the Liver, Da Costa on Medical Diagnosis, Loomis on Physical Diagnosis. *For Reference*—Reynold's System of Medicine, and Trousseau's Clinical Lectures.

SURGERY.—Syme edited by Maclean, Erichsen, Hamilton, Druitt, *Special Subjects*—Billroth on Surgical Pathology, Hamilton on Fractures and Dislocations, Bumstead on Venereal Diseases, Sayre on Club Foot, Sir Henry Thompson or Gouley on Genito-Urinary Diseases and Surgery, Van Buren and Keyes on the Genito-Urinary Organs, C. Henri Leonard on Bandaging. *In Minor Surgery and Surgical Ap-*

pliances—Bell, Le Gros Clarke, Anandale, Wales, Sargent. *For Reference*—Gross's System of Surgery, and Holmes's System of Surgery.

OPHTHALMOLOGY AND OTOLOGY.—*On the Eye*—Sœlberg Wells, Stellwag, Metz. *On the Ear*—Roosa or Toynbee with Hinton's Supplement.

The student who is commencing a course of reading, without an instructor, is recommended to devote the most of his time for the first year to the elementary branches, Anatomy, Physiology, and Chemistry, both general and medical; then advancing to the other studies to select one of the first mentioned text-books in each department, passing to the "*special subjects*" only when near the completion of the course, or as he may desire for particular reasons, to become more fully informed on such subjects. The books mentioned are standard authorities, and will form a good nucleus for a medical library.

IX. ASSIGNMENT OF SEATS.

Students on arriving in Ann Arbor can obtain necessary information in regard to rooms, board, etc., by calling at the Steward's office. Seats in the lecture-rooms are assigned by selection to students in the order of registration on the Steward's books, and each student is expected to occupy during the session such seat as he may select. The graduating class, by courtesy, are allowed the privilege of the seats nearest the operating table and lecture desk.

Letters of inquiry may be addressed to the "Dean of Medical Faculty," Ann Arbor, Mich.

By comparing the present with the older Announcements, it will be seen that material advancements have been made in the facilities offered for a complete and thorough medical education; and it is the policy of the authorities of the College to advance in the future, both in facilities and requirements, in accordance with what may be judged the judicious demands of an enlightened profession and the best interests of the public.

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Willis P. Spring, B.A., Oberlin College.	*Columbus, Ohio*,	Faculty.

Alice M. Stark,	*Ypsilanti*,	R. A. Gerry.
Samuel Seymour Stearns,	*Grand Rapids*,	Faculty.
Leander A. Steele,	*Byron*,	Wm. Caldwell.
George Mitchell Swaine,	*Somerset*, *N. Y.*,	H. C. Hill.
Clarence Fletcher Swift,	*Maysville*, *Ind.*,	W. C. Chaffee.
Frances Augusta Tenuy,	*Plainwell*,	B. Thompson.
Leicester M. Thompson,	*Lanesville*, *Ohio*,	Dr. Halderman.
Elnora A. U. Totten,	*Ann Arbor*,	Z. H. Blake.
James H. Travis,	*Simcoe*, *Ontario*,	J. M. Fowler.
Abby E. Vaill,	*Litchfield*, *Conn.*,	R. Ormiston.
Robert Henry Van Cleve,	*Pimento*, *Ind.*,	J. Parker.
Henry Van Den Berg,	*Zealand*,	W. Van Den Berg.
Ashman H. Vandivert,	*Bethany*, *Mo.*,	J. Walker.
C. C. Van Valkenburg,	*Bay City*,	J. Greene.
John Edward Vaughan,	*Smith's Mills*,	W. H. Edwards.
Sophia Volland,	*Ann Arbor*,	Faculty.
A. T. Wakefield, B.A., B.S., Marietta College, and Mass. Ag. College.	*La Harpe*, *Ill.*,	S. O. Loughridge.
F. Eugene Walbridge,	*Weyauga*, *Wis.*,	J. S. Walbridge.
Wyllys Seaman Walkley,	*Grand Rapids*,	S. A. Hildreth.
Homer Pizarro Walling,	*Coldwater*,	H. B. Townsend.
Thomas W. Waterson,	*Mottville*,	E. Watson.
George Watson,	*Auburn*, *Ill.*,	W. G. Lumley.
Matthew Watts,	*Varna*, *Ontario*,	Dr. Stewart.
William Joshua Webb,	*Milford*, *Del.*,	J. O. Pierce.
Emma F. Wells,	*Peru*, *Mass.*,	J. W. Hastings.
S. Addison Wessel,	*Ames*, *N. Y.*,	Dr. Smith.
Henry Mason Wheeler,	*Northfield*, *Minn.*,	C. M. Thompson.
John L. White, PH.B.,	*Ann Arbor*,	G. E. Frothingham.
Robert Wilcox,	*Mohegan*, *R. I.*,	Benj. Joslin.
T. Herman Wilcox,	*McDougall*, *N. Y.*,	A. J. Alleman.
George James Wilder,	*Coldwater*,	S. S. Cutler.
Antoinette Williams,	*Lawrence*, *Kansas*,	R. L. Williams.
George W. Williamson,	*Wamego*, *Kansas*,	A. Morrell.
Frank William Wilson,	*Edgeworth*, *Ontario*,	D. Stewart.
Benj. W. S. Wiseman,	*Marmont*, *Ind.*,	G. A. Dunn.
Chas. P. Woodring, B.A., Alleghany College.	*Meadville*, *Pa.*,	D. Best.
Lettie Helen Woodruff,	*Ann Arbor*,	McCarin & Gleason.
Wallace Wm. Woodruff,	*Pontiac*,	Faculty.
C. W. Wooldridge, B.S.,	*Ionia*,	H. B. Barnes.
Arthur Leland Worden,	*Ann Arbor*,	Faculty.

DEPARTMENT OF LAW.

I. DEPARTMENT OF LAW.

In this department it has been the endeavor, alike of the Regents and of the Faculty, to make the instruction imparted and the advantages afforded equal to any attainable elsewhere in the country; and in this they believe they have been entirely successful. They intend to spare no effort on their part to render it deserving in the future of the prosperity it has hitherto enjoyed. A spacious building has been erected for its accommodation, with ample debating and society rooms, and in every respect the conveniences of the department are unsurpassed.

II. TERMS OF ADMISSION.

The requisites for admission are, that the candidate shall be eighteen years of age, and be furnished with a certificate giving satisfactory evidence of good moral character. No previous course of reading is required, and the course of instruction for the two terms has been carefully arranged, with a view to enable students to enter profitably at any stage of their studies, and at either term.

III. COURSE OF INSTRUCTION.

The design of the department is to give a course of instruction that shall fit students for practice in any part of the country. The course will embrace the several branches of Constitutional, International, Maritime, Commercial and Criminal Law, Medical Jurisprudence, and the Jurisprudence of the United States; and will include such instruction in Common Law and Equity Pleading, Evidence and Practice, as will lay a substantial foundation for practice in all departments of law.

The course will be continued through a period of two years, with one term in each year, commencing this year on the second day of October, and continuing until the Law Commencement in the last week of March ensuing. Ten lectures and examinations will be held each week during the term. For one year they embrace the following subjects:

The Origin and History of Equity Jurisprudence.
The General Heads of Equity Procedure and Nature and Forms of Equitable Remedies.
Criminal Law;
The Laws of Evidence, and their application to Legal Proceeding;
Contracts;
Title to Personal Property, by Gift, Inheritance, Sale, Mortgage, Assignment, and by Operations of Law; Bailments;
Bills of Exchange and Promissory Notes, and Commercial Law generally;
Estates in Real Property;
Easements;
Title to Real Property;
The Domestic Relations.

For the year after, the following subjects:

Some Special Heads of Evidence, and Equity Jurisprudence:
Equity Pleading and Practice; Jurisprudence of the United States;
Shipping and Admiralty;
Agency; the Law of Corporations; Common Law Pleading and Practice; Constitutional Law; Partnership; Uses and Trusts; Wills, their Execution, Revocation, and Construction.
The Administration and Distribution of Estates of Deceased Persons.

Moot Courts are held at least once a week during the term, for the argument of cases previously given out by the Professors to students designated to discuss them. They will be presided over by the Professor lecturing for the day, who, at the conclusion, will review the arguments and give his decision upon the points involved. Club Courts will also be organized among the students, to be arranged and conducted by themselves, with such assistance from the members of the Faculty as may be desired. These Courts, thus far, have been found alike interesting and useful to those who have participated in them.

IV. LIBRARY.

A well selected and very useful Law Library is open for consultation by students at all reasonable hours. The rooms of the Professors adjoin the Library, and they will be ready at all times to furnish to students such aid in their studies and investigations as they may desire.

The General Library of the University is also at all times open to the students of this department. The Law Library has been considerably increased within a few years by a donation, by the Hon. RICHARD FLETCHER, late one of the Justices of the Supreme Court of Massachusetts, of a considerable portion of his own library of law books.

V. DEGREES.

The Degree of Bachelor of Laws will be conferred upon such students as shall pursue the full course of two years in this department, and pass an approved examination. It will also be conferred upon those who, having attended another Law School for a period equal to one year of our course, or practised law for one term under a license from the highest court of general jurisdiction in any State, shall also pursue one year's course in this department, and pass a like examination. In Michigan, the degree entitles the resident graduate to an immediate license to practise in all of the courts of the State.

Candidates for degrees will be required to prepare and deposit with the Faculty, at least one month before graduation, a dissertation not less than forty folios in length, on some legal subject selected by themselves. These theses will be filed and preserved in the Library.

VI. BOOKS.

While several copies of each of the leading text-books will he found in the Library, it is exceedingly desirable that students should supply themselves with such as they may need at their rooms. The Professors will lend them aid in making proper selections, and no loss will be incurred, as the books will be found essential in subsequent practice. Students will find that it will greatly facilitate their studies to have them at hand at all times.

VII. GENERAL REMARKS.

The Faculty are frequently applied to by letter for advice upon the question whether it is desirable to enter upon the study of law, and acquire some general knowledge of the principles, before admission to the department. It is somewhat difficult to lay down general rules that can be advantageously applied in all cases, but the Faculty are of the opinion that, for the first year at least, more positive benefit is received from the lectures, and more positive advancement in the law made, by students who have read before coming, at least the Commentaries of Blackstone, than by those who are beginners here. But the Faculty are aware of the difficulty experienced by the student in giving proper direction to his reading and investigations at the beginning; and they do not, therefore, make it a condition of admission that there shall be any prior reading in the law whatever. The want of such prior reading will, doubtless, in many cases, be fully compensated in the aid the beginner may receive here in the outset. It is not often that the student receives the needed assistance, except in Law Schools. The active practitioner, engrossed with the cares of business, cannot—or, at least, as proved by experience, does not—furnish the students who place themselves in his charge, the attention and assistance essential to give a correct direction to their reading, and to teach them to apply it usefully and aptly in their subsequent professional life. The reading of a student in a law office is practically the study of the law by himself, and without assistance; and he neither acquires that familiarity with books and that facility of reference which it will be the aim of this department to assist in acquiring, nor learns anything of the practical applications of legal principles, beyond what he may pick up from observation of the practice of his preceptor. The effort here will be to make, not *theoretical* merely, but *practical* lawyers; not to teach principles merely, but how to apply them. To this end, the Moot Court will be made the forum for the discussion of such practical questions as must frequently arise in a professional career at the bar; and the attention of the Faculty will be directed not less to the application of the points discussed to actual cases, than to the elucidation of the legal questions. An opportunity will be afforded all the senior students to participate in this court, and they will at all times have such assistance in their Club Courts as they find themselves in need of.

While thus sedulously endeavoring to impart legal knowledge, the fact will not be lost sight of, that a high moral standard is a most important requisite to a successful and honorable legal career; and no pains will be spared in impressing this fact upon students, and in inculcating a high tone of professional ethics and action.

Those who desire any further information concerning the Law Department, may make their inquiries of Hon. T. M. COOLEY, Dean of the Law Faculty.

THE FACULTY

OF THE

DEPARTMENT OF LAW.

JAMES B. ANGELL, LL. D.,
PRESIDENT.
JAMES V. CAMPBELL, LL. D.,
THOMAS M. COOLEY, LL. D.,
DEAN.
CHARLES A. KENT, M. A.,
WILLIAM P. WELLS, M. A.

STUDENTS.

SENIORS.

Name.	Residence.
Morris Abeles,	*Leavenworth, Kan.*
Truman Edson Ames,	*Potsdam, N. Y.*
Oscar Edward Angstman, B.S., Michigan Agricultural College.	*Southfield.*
John Henry Baker,	*Sullivan, Ill.*
Frank Augustus Baldwin,	*Green Springs, Ohio.*
Alton Will. Bennett,	*Cassopolis.*
James Winch Bucklin,	*Lodi, Ill.*
Thomas Bernard Buckner, B.S., Westminster College.	*Mexico, Mo.*
Albert Burgess,	*Detroit.*
Otto Charles Butz,	*Chicago, Ill.*
Silas Horatio Callender,	*Lawrence, Ill.*
Robert Stuart Campbell,	*St. Joseph, Mo.*
James Wellington Carr,	*Ann Arbor.*
Francis Grigsby Carpenter,	*Detroit.*
Edwin T. Cass,	*East Troy, Wis.*
Ira Wallace Castle,	*Stillwater, Minn.*
George Warren Chamberlin,	*Sterling, Ill.*
William Asbury Chase,	*Clearfield, Pa.*
William Tucker Coad,	*Mineral Point, Wis.*
Alfred James Coates,	*Bolivar, Tenn.*
Charles Louis Colvin,	*Wyandotte, Kansas.*
John Conner,	*Iosco.*
Thomas C. Conrad,	*Petaluma, Cal.*
Charles Wilkins Cox,	*Little Rock, Ark.*
Thomas R. Crisup,	*Detroit.*
John W. Creveling, B.A., Lafayette College.	*Bloomsburg, N. J.*
Adelbert Culver,	*Albion.*
Thomas Alfred Dignan,	*Ann Arbor.*
Charles N. Dolson,	*Arcola, Ill.*
Melville Cox Ebright,	*Wooster, Ohio.*

James Clarence Ellis,	*Fayette, Miss.*
Arnold W. Eschenburg,	*Chicago, Ill.*
William Henry Fairchild,	*Fairfield, Vt.*
Frank Levi Fales,	*Charlotte.*
S. Olin Foster,	*Ann Arbor.*
Lucius W. Frazer,	*Detroit.*
Isaac Andrew Gilbert,	*Bay City.*
William Dennis Gilbert, B.A., Kansas Agricultural College.	*Atchison, Kansas.*
Charles Pierce Gilchrist, B.A.,	*Ann Arbor.*
Daniel Virgil Gore,	*Carlisle, Kentucky.*
Edward Alonzo Gott, PH. B.,	*Ann Arbor.*
Darwin C. Griffin,	*Ypsilanti.*
Gerald Griffin,	*Ann Arbor.*
Hugh DeLoss Grigsby,	*Pittsfield, Ill.*
Matthew Franklin Guinon,	*Scio.*
Frank Darius Hale,	*Lunenburg, Vt.*
William Irving Hamilton,	*Battle Creek.*
William Henry Harris,	*Battle Creek.*
Whitman T. Hines,	*Woodstock, Ill.*
William Theophilus Hodson,	*Apple River, Ill.*
Charles Ripley Hopson,	*Elgin, Ill.*
Robert Hovenden, M.A., Oberlin College.	*Pontiac.*
D. Darwin Hughes, Jr.,	*Grand Rapids.*
Lucius D. Johnson,	*Lansing.*
Francis Everett Jones,	*Saline.*
W. Scott Judy,	*Tallula, Ill.*
Francis Marion Landram,	*Warsaw, Ky.*
Frank Larzaleer,	*Tekonsha.*
Myron Chatham Lingle,	*Lock Haven, Pa.*
Medary Dale Mann,	*Westerville, Ohio.*
Nathan Abijah Mann,	*Westerville, Ohio.*
Ralph Norris Marble,	*Lansing.*
Reuben Henry Markham, B.A., Oberlin College.	*Albany, Oregon.*
Hattie Mason,	*Ann Arbor.*
Richard Louis McDougall,	*Warsaw, Ill.*
Cassius Dixon McEwen,	*Royal Oak.*
Joseph James McKee,	*Lebanon, Ill.*
Francis R. McKennon,	*Berryville, Ark.*
E. Willam Loren McLaughlin,	*Charlotte.*
John Andrew McMahon,	*Marlette.*
Donald McPherson, B.S., Michigan Agricultural College.	*Lansing.*

John Michell,	*Portland, Oregon.*
Samuel Murphy,	*Harrison, Ark.*
Charles Bruce Moores, B.A., Willamette College.	*Salem, Oregon.*
Samuel Johnson Nelson,	*Rochester, Minn.*
Henry Ohrns, Jr.,	*Mt. Clemens.*
Charles Wallace Perry,	*Flint.*
Charles Leonidas Phelps,	*Oregon, Ill.*
Frederick Bryan Phillips,	*Fredericktown, Mo.*
Hermann Pistorius,	*Ann Arbor.*
Walter Scott Powers,	*Assyria.*
Frank Augustus Reid,	*Bowling Green, Ohio.*
Frank George Reynolds,	*Battle Creek.*
Claudius M. Rivers,	*Stillwater, Minn.*
James C. Reiger,	*Kansas City, Mo.*
Millard Fillmore Riggle,	*Logansport, Ind.*
Reuben Roof,	*Fort Plain, N. Y.*
Dudley P. Safford, B.A., Racine College.	*Coldwater.*
Theodore Stanfield Shaw	*San Jose, Cal.*
John Evans Simonson, B.S., Michigan Ag. College.	*Bay City.*
Charles A. Manley Spencer,	*Ann Arbor.*
Seymour C. Spencer,	*East Saginaw.*
George Milton Sprout,	*Pinckney.*
Calvin C. Stanley,	*Champaign, Ill.*
Ashbel Green Steiner,	*Grand Rapids.*
Robert W. Stewart,	*Dubuque, Iowa.*
Louis S. Steifel,	*Wheeling, W. Va.*
Samuel Calvin Stough,	*Waterloo, Ind.*
Frank Hammond Sweet,	*Grand Rapids.*
James Tait,	*Huntley, Ill.*
John Lafayette Talbot,	*Ann Arbor.*
Arthur Bruce Taylor,	*Salt Lake City, Utah.*
William B. Taylor,	*Wyandotte, Ks.*
Louis Beuner Tuller,	*Worthington, Ohio.*
John A. Turner,	*Orangeville.*
Frank Bortle Tuttle,	*Oneida, N. Y.*
John Burgess Utt,	*Platteville, Wis.*
Samuel Waldo Vandivert,	*Bethany, Mo.*
Jeremiah Green Wallace,	*Dover, Ark.*
William Watts,	*Hudson, Wis.*
William Henry Wells, B.A.,	*Ann Arbor.*
Franklin Emory Wheaton,	*Wheaton, Ill.*
G. Frank White,	*Chicago, Ill.*

Girden O. Williams,	*Williamstown.*
William Brown Williams, M.A.,	*Lapeer.*
Ariel Newton Wilson,	*Ann Arbor.*
Arion E. Wilson,	*Shelocta, Pa.*
George Adolphus Wood,	*Springfield, Ill.*
Florentine C. Woodworth,	*Plainfield.*
John W. Yerkes, B.A., Centre College.	*Danville, Ky.*
Bertrand Dealton York,	*Ann Arbor.*
Alfales Young,	*Salt Lake City, Utah.*
Frank E. Young,	*Ann Arbor.*
Charles H. Young,	*Crown Point, Ind.*

JUNIORS.

Name.	Residence.
James M. Ashley, Jr., B.S., Cornell University.	*Ann Arbor.*
Warren Ashley,	*San Francisco, Cal.*
Loraine Ashman,	*Three Springs, Pa.*
Charles Albert Barnes,	*Jacksonville, Ill.*
William Lincoln Bassett,	*Minneapolis, Minn.*
Frederick George Belford,	*Lostant, Ill.*
Charles Pallerson Belle, B.S., McKendree College,	*Cobden, Ill.*
Joseph P. Black,	*Apple River, Ill.*
William James Black,	*Nottawa.*
A. Thomas Bratton,	*Edon, Ohio.*
Archer Briggs,	*Battle Creek.*
Roscoe W. Broughton,	*Paw Paw.*
James Hull Brown,	*Monticello, Ill.*
Robert B. Brown,	*Warsaw, Ky.*
Alfred Lincoln Brown, B.A., Oberlin College.	*Newark, Ill.*
John Edgar Browne,	*Arnot, Pa.*
Frank G. Bohri,	*Fountain City, Wis.*
James M. Boyd,	*Goliad, Texas.*
John Michael Burke, M.S., Adrian College.	*Morenci.*
Thomas M. Campbell,	*Arcanum, Ohio.*
William Carter, Jr.,	*Defiance, Ohio.*
Robert Carey,	*Detroit.*
Lewis Addison Carr,	*Steubenville, Ohio.*
Joseph Clark Cather,	*Flemington, W. Va.*
Jacob Calvin Clark,	*Big Rapids.*

Waldo Emerson Clark,	*Detroit.*
Henry R. Cocker, B.S.,	*Ann Arbor.*
Charles Conner, B.S.,	*Utica.*
William Henry Cook,	*Chicago, Ill.*
Zimri L. Cooper,	*Pokagon.*
Joseph Burton Connell, PH.B., Illinois College.	*Jacksonville, Ill.*
Roscoe Laforest Corbett,	*Big Rapids.*
Benjamin J. Corbin,	*Ann Arbor.*
Charles Arthur Conillard,	*Richfield, Minn.*
William Alfred Crandall,	*Ann Arbor.*
Charles Lore Daughton,	*Wilmington, Del.*
Frank Fremont Dawley,	*Fort Dodge, Iowa.*
William Tell De Bann,	*Ann Arbor.*
Edward Donovan, B.S.,	*Ann Arbor.*
Benjamin F. Dozier,	*Decatur, Ill.*
Charles M· Drandorff,	*Chicago, Ill.*
George Jefferson Dorrell,	*Illiopolis, Ill.*
Anderson S. Dwyre,	*Kendall, Ill.*
George Albert Elder,	*Austin, Minn.*
John Hart D. Everett,	*Manistee.*
William James Feltenbarger,	*Allegan.*
John E. Fink,	*Saruna, Ill.*
Jura Cardot Fullerton,	*Portsmouth, Ohio.*
John Owen Garrett,	*Nottawa.*
General George Gates,	*Modesto, Cal.*
Hiram Gibson,	*Gibson, Wash. Ter.*
Louis P. C. Godfrey,	*Monroe.*
Fred H. Gould, C.E., Penn. Military Academy.	*Owosso.*
Thurston P. Hackleman,	*Albany, Oregon.*
Henry Allyn Haigh, B.S., Mich. Agricultural College.	*Lansing.*
Charles Fremont Hammond,	*Mason.*
Clement Milton Hammond,	*Marion, Mass.*
Henry Hanaw,	*Jackson.*
Harry Phillip Hancock,	*Cazenovia, N. Y.*
John Hanitch,	*Dayton, Ohio.*
Charles Fred Harry,	*Detroit.*
Abner Kellogg Haywood,	*Conneaut, Ohio.*
Charles Walker Hazell,	*Boonville, Mo.*
Charles Henry Heighton,	*Galion, Ohio.*
Joseph Hidy, Jr., PH.B., Buchtel College.	*Detroit.*
Henry Hoffman,	*Tyrone.*

Cecil Sabin Holley,	*Mason.*
Clayton John S. Hoover,	*Allen, Pa.*
William Robert Horner,	*Springfield, Ohio.*
Abram F. Hostetter,	*Oregon, Pa.*
Edwin J. Howe,	*Orleans.*
Enoch Thatcher Howes,	*Portland, Oregon.*
Charles Fremont Hudson,	*Tuscola, Ill.*
John C. Hunt,	*Tuscola, Ill.*
Eugene Ralph Hutchins, PH.B.,	*Ann Arbor.*
Charles Sumner Ingersoll, B.S., Mich. Agricultural College,	*Monroe.*
Fred G. Ingersoll,	*St. Paul, Minn.*
Frank Joseph Jerome,	*Plainsville, Ohio.*
William Allen Johnston, B.A., University of the Pacific.	*San Jose, Cal.*
James Washington Johnston,	*Oregon, Ill.*
Asa Jones,	*Piper City, Ill.*
Samuel Clark Jones,	*Stillwater, Minn.*
John Paul Jones,	*Detroit.*
Kate Kane,	*Ann Arbor.*
John P. Kellas,	*Moore's Forks, N. Y.*
Wilfried Ivanhoe Klein,	*Barry, Ill.*
Jerome Cyril Knowlton, B.A.,	*Ann Arbor.*
Elbert Le Roy Lampson,	*Windsor, Ohio.*
Victor Hugo Lane, C.E.,	*Ann Arbor.*
Charles Newcomb Lauman,	*Burlington, Iowa.*
Frank Barbour Lay,	*Allegan.*
Myron W. Lee,	*Golden Spring, Neb.*
Henry Lindner,	*Sebewning.*
Charles Logan,	*Arnot, Pa.*
Patrick William Magrath,	*Granite, Kansas.*
Herbert S. Maguire, M.A.,	*Detroit.*
Almo Fremont Manson,	*Pittsburg, Pa.*
John Stockton Marquis,	*Dunningsville, Pa.*
Albert Eugene Mason,	*Charlevoix.*
John R. Mason,	*Ransom.*
David L. Matthews,	*Butler, Pa.*
Calvin Leonidas May,	*Steubenville, Ohio.*
John Ferguson McAlister,	*Nairn, Ontario.*
James Henry McDonald, B.A.,	*Ann Arbor.*
J. Bob McGuffin,	*P't Pleasant, W. Va.*
James McKellar,	*Detroit.*
John Henry Merrill,	*Brockway Centre.*
Selden Spencer Miner,	*Corunna.*

Charles A. Montgomery, B.S., Dartmouth College.	*Newark, Ohio.*
William Newberry Moore,	*White Lake.*
Charles Campbell Nelson,	*Ann Arbor.*
Frederick T. Nunn,	*Peru, Ind.*
Julius Sinclair Ogan, B.A., Oberlin College.	*Columbus Grove, O.*
Eiebert G. Ogden,	*New York, N. Y.*
Thomas Francis O'Mahony, M.A., Notre Dame University.	*Lake Forest, Ill.*
Lyman Adelbert Orr,	*Caro.*
Herman Henry Osthaus, B.A., Allegheny College.	*Overton, Pa.*
Joel Webster Page,	*Waterville, Vt.*
Alfred Noble Paxton,	*Cincinnati, Ohio.*
Franklin Pierce Payne,	*Emporia, Kansas.*
Edwin Zina Perkins,	*Barrie, Ontario.*
Thomas Francis Phelan,	*Adrian.*
Cyrus L. D. Phelps,	*Chicago, Ill.*
Benj. Sheldon Phillips,	*Ogdensburg, N. Y.*
Eugene Douglas Pierson,	*Hudson.*
Charles Walter Howard Potter, B.A.,	*Ashland, Ohio.*
James M. Powers,	*Assyria.*
Reuben Wilson Powers,	*Grand Rapids.*
Franklin Henry Pray,	*Detroit.*
Daniel E. Prescott,	*Manchester, Iowa.*
Eugene E. Prussing,	*Chicago, Ill.*
D. Wilbur Reardon,	*Ludington.*
Herbert Stanley Reed,	*Parkville.*
Daniel Clark Remick,	*Colebrook, N. H.*
Henry Kendall Rhoades,	*Quincy, Ill.*
Thomas Rinaker, B.A., Blackburn University.	*Carlinville, Ill.*
Hermann Ritter,	*Edwardsville, Ill.*
Charles Humphrey Roberts,	*Short Creek.*
John Robertson,	*Detroit.*
Charles Byron Robison,	*Russell, Ohio.*
H. Frederick Rhode,	*Parkville.*
Henry Wade Rogers, B.A.,	*Ann Arbor.*
Edward Parker Rose,	*Ann Arbor.*
Joseph Charles Royan,	*Houston, Ohio.*
Frank Finley Rozzelle,	*Breckinridge, Mo.*
Wilbur Fremont Rudz, B.A., College of New Jersey.	*Hayesville, Ohio.*
James Allen Runyan,	*Butlersville, Ohio.*
Kinpay Saito, B.S., Pacific University.	*Tokio, Japan.*

Charles J. Sawbridge,	*Alexandria, Minn.*
Horace B. Schaeffer,	*Valley Falls, Kansas.*
M. Timothy Sheil,	*Sheilsville, Ind.*
George Henry Sleator,	*Dexter.*
Charles William Smith,	*East Lynne, Mo.*
Channing Smith,	*Ann Arbor.*
Daniel Remseh Smith,	*Ann Arbor.*
George Smith,	*Bowling Green, O.*
James A. Stacy,	*Adrian.*
George Howard Steiner, Jr.,	*Grand Rapids.*
Henry F. Stevenson,	*Green Castle, Ind.*
William D. Talbot,	*Ann Arbor.*
Henry Gee Taylor,	*Ann Arbor.*
Alden Stewart Thompson,	*Tidioute, Pa.*
Charles T. Thompson,	*Detroit.*
John A. Tindall, B.S., Shelbyville College.	*Shelbyville, Ind.*
Henry S. Trempton,	*Battle Creek.*
Mason G. Tureman,	*Carlisle, Ky.*
Isaac M. Turner,	*Grand Rapids.*
Samuel W. Vance,	*Forest, Ontario.*
Reuben W. Voners,	*Grand Rapids.*
Claudius D. Walker,	*Winchester, Kansas.*
Myron Hamilton Walker,	*Grand Rapids.*
Warren Edwin Walker,	*Ann Arbor.*
George P. Wanty,	*Ann Arbor.*
James William Westbrook,	*Marion, Ill.*
Alvin C. White, B.S.,	*Parkman, Ohio.*
John Stuart Whitford,	*Garnett, Kansas.*
Smith Wilbur,	*Ann Arbor.*
Fred Potter Wilcox,	*Rochester, N. Y.*
Thomas Rawlins Wilcoxson, B.A.,	*Ann Arbor.*
Percy R. Wilson, B.A.,	*Columbus.*
John Henry Wishek,	*Sharon, Ohio.*
Frank Galbraith Wixson,	*Lexington.*
Gustav Adolph Wolf,	*Grand Rapids.*
Henry Wollman,	*Leavenworth, Kan.*
Randall Wymond,	*Aurora, Ind.*
James R. Wylie,	*Martin.*
William Yost, B.A., Monmouth College.	*Chicago, Ill.*

THE

HOMŒOPATHIC MEDICAL COLLEGE.

I. THE LECTURE COURSE.

THE third annual course of lectures will commence on Monday, October 1st, 1877, and will continue until the last Wednesday in March, 1878, with a recess during the holidays.

II. TERMS OF ADMISSION.

Every candidate for admission to the Homœopathic Medical College must be eighteen years of age, and must present to the Faculty satisfactory evidence of good moral character. Unless already a matriculant of this University, or a graduate of some respectable college, academy or high school, every candidate shall be examined as to his previous education and his fitness for entering upon and appreciating the technical study of medicine. The diploma or certificate of graduation from such institution must be presented to the Dean of the Faculty by the candidate, in order to secure exemption from this examination, *which will be in writing, and will cover the ordinary branches of an English education.*

Examinations will be held at 2 P. M. on Fridays and Saturdays, September 28 and 29, 1877. Candidates are required to present themselves on one of these days, as they are expected to be in attendance upon the first day of the term, at which time the regular course of instruction will commence. To provide for cases in which it is absolutely impossible for the candidate to be present at this time, supplementary examinations will be held at such times as may be determined upon by the Faculty, but no excuse except of an urgent character will be accepted for failure to appear at the first examination. Certificates of attendance are given *for the actual period of attendance only.*

Before admission to examination, every student is required to present to the Dean of the Faculty the Steward's receipt for the payment of the annual dues. It will therefore be necessary for the candidate to apply *first* to the Steward, at his office in University Hall, register his name as a student in the Homœopathic Medical College, and pay his fees. In case of rejection the moneys paid preliminary to examination will be refunded by the Steward.

III. ADMISSION OF WOMEN.

Recognizing the equal rights of both sexes to the higher educational advantages, the Board of Regents a few years ago made provision for the medical education of women, and they are now admitted to this, as to all of the departments of the University, on the same conditions that are required of men. It is proper to state, however, in answer to the numerous inquiries which are made on this point, that the course of instruction for women, though equal in all respects to that provided for the men, is given separately; the two classes not being brought together in the lecture-rooms, except in the department of General Chemistry. Ample provision of lecture-rooms, dissecting-rooms, etc., has been made for the classes of women.

IV. FACILITIES FOR INSTRUCTION.

Students in this College will receive instruction in Materia Medica and Therapeutics from Prof. Jones, in Theory and Practice of Medicine from Prof. Morgan, in Obstetrical Therapeutics from Prof. Rockwith, and in Surgical Therapeutics from Prof. Gilchrist.

To gain instruction in General Chemistry, Anatomy, Organic and Applied Chemistry, Physiology, Ophthalmology, Otology and Practical Anatomy, Surgery, Obstetrics and Diseases of Women and Children, they will attend the lectures on those subjects in the "Department of Medicine and Surgery." While in attendance on such lectures they shall be entitled to all the privileges accorded to students in said department, and shall conform to all requirements of said department, so far as they apply to the branches which they pursue.

Four lectures are attended daily. Previous to each lecture students are examined, in accordance with a by-law of the Board of Regents, on the subject of the preceding lectures.

Clinics will be held under the direction of the Professors of this College.

Liberal provision is made by the Board of Regents for illustrating the various branches of instruction by plates, preparations, specimens, and apparatus. The department of chemistry and chemical physics is probably unsurpassed, if indeed it is equalled, in the extent and thoroughness of its equipments, by that of any medical college in the country. The museums, containing several thousand specimens, comprise a valuable collection of bones, amply illustrating both physiological and pathological conditions of all ages, and showing the processes of dentition, of growth, and of decay in the osseous system, dried preparations, normal and abnormal, of the different tissues of the body, embracing muscles, blood-vessels, nerves, etc.; models and casts illustrating skin diseases, tumors and pathological changes in the various organs. In the sections devoted to comparative embryology and craniology, and in human embryology and the diseases of women, the collections are especially interesting. The specimens of monstrosities, both single and double, of man and the lower animals, are very numerous and instructive.

Arrangements have been made, by which an ample supply of *material* for the purpose of Practical Anatomy has been secured, and special attention will be devoted to rendering this important study as advantageous as possible to the student. Experience has shown that *material* can be purchased here abundantly, and at reasonable rates.

Free access is allowed the student to the general Botanical, Zoölogical and Geological cabinets of the University, which are estimated to contain about 250,000 specimens. If he desires and has leisure, he can also, by permission, attend the scientific and philosophical lectures of special interest to him, which are given in the Literary Department.

The General Library, which is open day and evening, except on Sundays, contains about 23,000 volumes, comprising a large number of medical works. A large number of the leading medical periodicals of Europe and America, in which the teachings of both schools are represented, are taken and kept on file in the University.

The Chemical Laboratory, which has been recently enlarged, contains 175 separate tables for students. It is provided with six excellent, sand, water and steam baths and drying ovens. The furnace room is furnished with all the apparatus for organic analysis. The Laboratory Library contains all the standard works and the leading European and American periodicals on chemistry and the allied sciences. The Laboratory is, in short, one of the most thoroughly equipped, as it is probably the largest in the country.

Every candidate for the Degree of M. D. is required to pursue the study of practical medical chemistry in the Laboratory, until he has completed a course of from twelve to fifteen weeks. Supplies are furnished him at the price-current of New York dealers. The average expense is found to be one dollar and ten cents a week for Laboratory students. For detailed account of Laboratory work see page 78.

V. CONDITIONS OF GRADUATION.

Each candidate for graduation must announce himself as such at *the beginning of the second course*, and must at that time undergo a preliminary examination in Anatomy, Physiology, Materia Medica and Chemistry.

To be admitted to the degree of "Doctor of Medicine" in this College, the student must exhibit to the Dean evidence of having pursued the study of Medicine and Surgery for the term of three years, with some reputable practitioner of Medicine, (including lecture terms); must have attended two full courses of lectures, the last of which must have been in the Homœopathic Medical College of the University of Michigan, and the previous one in this or some other reputable Medical Institution; must have been engaged in the study of Practical Anatomy and Practical Chemistry; must be twenty-one years of age; must have submitted to the Faculty a thesis, composed and written by himself, on some medical topic, and have passed an examination, at the close of the term, satisfactory to the Faculty. He is also required, during the course, to submit to written examinations by each Professor, on some subject pertaining to his department, in order to test further his knowledge of such subjects, and his ability to express himself correctly in writing. His final thesis may be written in English, German, French, or Latin; and, if required, must be defended before the Faculty. The theses of successful candidates are to be preserved among the archives of the College; those of rejected applicants returned.

It is generally admitted that the course of study in most of our American Medical Schools is too short to secure the thorough and extended instruction which is to be desired. The authorities of the University are not yet prepared to *require* a longer attendance than they have heretofore asked; but they do earnestly *recommend* students to enter the college early in their course, and to attend through *three* terms instead of through two terms.

Each Professor, on whose instruction the student is required to attend, will, on the completion of the required course of study, and upon the student's giving the necessary evidence of professional scholarship, furnish such student with a certificate to that effect, and the certificate will be laid before the Board of Regents, who will award the Degrees.

All students graduating from the Homœopathic Medical College shall be furnished with diplomas so designated, signed by the President and Secretary, and bearing the corporate seal of the University.

To encourage a higher grade of preliminary acquirements, an allowance of six months from the term of study is made in favor of graduates of the Department of Science, Literature and the Arts, and of other respectable Literary Colleges, in evidence of which a diploma must be exhibited.

Also, an allowance of twelve months is made for graduates of the Department of Pharmacy in this University.

The week preceding Commencement will be devoted to the examination of candidates.

VI. EXPENSES.

The only charges made by the University are: To residents of Michigan, an admission fee of ten dollars, and the annual payment of fifteen dollars; to those who come from other States or countries, an admission fee of twenty-five dollars, and the annual payment of twenty dollars. Further particulars concerning expenses may be found on page 22.

VII. TEXT AND REFERENCE BOOKS.

MATERIA MEDICA AND THERAPEUTICS.—Hahnemann's Materia Medica Pura, Hahnemann's Chronic Diseases, Hempel's Materia Medica, 2d Edition, Hale's New Remedies, 2d Edition, Allen's Encyclopedia of Materia Medica, Hering's Condensed Materia Medica, Hughes's Manual of Pharmacodynamics, Hughes's Manual of Therapeutics, Hartmann's Observations on Hamœopathic Remedies, 1st and 2d Series. *For Reference*—Pereira, Wood, Stille, Phillips, Ringer, Bartholow, Christison on Poisons, Taylor on Poisons.

THEORY AND PRACTICE OF MEDICINE.—Hahnemann: Organon; Chronic Diseases; Lesser Writings. Bönninghausen: Repertory; Intermittent Fever; Whooping Cough. Jahr: Symtomatology; Repertory; Clinical Guide; Forty Years' Practice. Hering: Analytical Therapeutics. Bæhr: Science of Therapeutics. Grauvogl: Text-book of Homœopathy. Raue: Special Pathology and Diagnostics. Gilchrist: Surgical Therapeutics. Also, the pathological and practical works of A. R. Thomas, Laurie, Ruddock and Guernsey; and those of Aitken, Reynolds, Flint, Da Costa, Green, etc.

THERAPEUTICS OF OBSTETRICS, and Diseases of Women and Children: Guernsey's Obstetrics; Leadam's Diseases of Women and Children; Jahr's Diseases of Women; Ludlam's Diseases of Women.

SURGICAL THERAPEUTICS—Helmuth's Surgery; Franklin's Surgery; Gilchrist's Surgical Therapeutics.

The Text-books for the other branches are selected by the teachers thereof, and will be found on page 101.

THE FACULTY

OF THE

HOMŒOPATHIC MEDICAL COLLEGE.

JAMES B. ANGELL, LL. D.,
PRESIDENT.
SAMUEL A. JONES, M. D.,
DEAN.
JOHN C. MORGAN, M. D.,
JOHN C. GILCHRIST, M. D.,
F. A. ROCKWITH, M. D.

STUDENTS.

Name.	Residence.	Preceptor.
Erasmus Edward Adams,	*Romeo,*	C. Backus.
Amelia M. Atkins,	*Bristol, Conn.,*	H. E. Way.
J. Albert Baker,	*Three Rivers,*	A. L. Macomber.
Pat. Henry Bumpus, B.A.,	*Jackson,*	S. P. Town.
Juliet Caldwell,	*Chillicothe, Ill.,*	Smith & Stillman.
Joseph R. Campbell,	*Ann Arbor,*	Faculty.
Viott Crayton Campbell,	*Mahoopany, Pa.,*	F. C. Denison.
Mary A. Chamberlin, M.D.,	*Battle Creek,*	Faculty.
Edgar Frank Chase,	*Milan,*	A. J. Sawyer.
George H. Church,	*Geneva, N. Y.,*	N. B. Covert.
George H. Clark, M.D.,	*Ann Arbor,*	Practitioner.
Sarah J. Coe,	*Monroe,*	A. J. Sawyer.
Horace M. Corey,	*Waverly, N. Y.,*	J. M. Cadmus.
Alfred B. Craine,	*Ann Arbor,*	Faculty.
Charles Hercules Dale,	*London, Ontario,*	J. J. Lancaster.
John H. DeMay,	*St. Johns,*	A. J. Wigins.
Clark DeMuth,	*Toulon, Ill.,*	T. Baumister.
Sarah P. Engle,	*Three Rivers,*	W. E. Clark.
Peter Erb,	*Buffalo, N. Y.,*	Dr. Eispien.
Lottie E. Fitzgerald,	*Detroit,*	Faculty.
Wm. A. Franklin, PH.B., University of Wisconsin.	*Menominee,*	E. D. Kanouse.
John O. Garmon, B.S., Illinois Soldiers College.	*Adamsville,*	H. C. Shouse.
George Clinton Greene,	*Spring Prairie, Wis.,*	G. Guild.
Edward E. Hoit,	*Minneapolis, Wis.,*	D. M. Goodwin.
Chester S. Hubbard,	*Titusville, Pa.,*	J. L. Dunn.
Claudius B. Kinyon,	*Normal, Ill.,*	G. R. Woolsey.
Myron E. Knapp,	*Ann Arbor,*	L. E. Knapp.
John Mallory Lee,	*Palo,*	J. A. Baker.
Harriet A. Lewis,	*Detroit,*	L. M. Arnold.
Lucius Franklin Lincoln,	*Coldwater,*	L. M. Jones.
A. James Lonstorf,	*Negaunee,*	Faculty.
John Summerfield Martin,	*Plainville,*	R. Pengelly.

Charles Perry Miller,	*Three Rivers*,	W. E. Miller.
Samuel L. Moffat,	*Alpena*,	N. Wilkinson.
Rollin Charles Olin,	*Detroit*,	J. G. Gilchrist.
Israel Ohlinger,	*Dimondale*,	Faculty.
Warren Harvey Rand,	*Charlotte*,	G. T. Rand.
Alex. Hamilton Rogers,	*Ann Arbor*,	C. A. Jefferies.
Cyrenus Chapin Sayles,	*Lowell*,	Faculty.
Richmond Simmons,	*Salem*,	B. S. Knapp.
James E. Slaught,	*Somerset Centre*,	G. L. Gifford.
Knisley Soans,	*Monroe*,	R. Soans.
George Albert Tabor,	*Union Spring, N. Y.*,	O. W. Smith.
Charles Lewis Tisdale,	*Elmira, N. Y.*,	T. P. Tisdale.
Stephen Eugene Warner,	*Flint*,	B. L. Cleveland.
William Watts,	*Farmingdale, Ill.*,	J. A. Vincent.
Ellen M. Webster,	*Put-in-Bay Island, O.*,	E. C. Stroud.
Joel Sylvanus Wheelock,	*Battle Creek*,	John Kellogg.
Frank Newman White,	*Ann Arbor*,	Faculty.
Nathaniel C. Whitfield,	*Grand Rapids*,	I. S. Whitefield.
Frances M. Wright,	*Farmington Centre*,	V. A. Elliott.

COLLEGE
OF
DENTAL SURGERY.

I. ORGANIZATION.

At a session of the Legislature, in 1875, in compliance with a request from the Dental Association and many citizens of the State, an appropriation was made for the establishment of a Dental College in connection with the Department of Medicine and Surgery of the University of Michigan.

The Board of Regents at once took measures to secure the objects contemplated, by making the necessary appointments of Professors, besides those furnished by the Department of Medicine and Surgery, where all students in Dentistry attend lectures and receive instructions jointly with the medical class, and enjoy in all respects equal facilities with them.

II. LENGTH OF TERM.

The third session of the Dental College will begin on the 1st of October, 1877, and close on the last Wednesday of March following, thus making a course of six months. The Faculty earnestly recommend that students be in attendance at the opening, as seats are selected in the order of matriculation, and regular instruction commences at once.

III. QUALIFICATIONS FOR ADMISSION.

These are the same as those which secure admission to the Department of Medicine and Surgery, and are as follows: Every candidate for admission must be eighteen years of age, and must present to the Faculty satisfactory evidence of a good moral character. Unless already a matriculant of the University or a graduate of some respectable college, academy or high school, every candidate shall be examined as to his previous education and his fitness for entering upon and appreciating the technical study of medicine. The diploma or certificate of graduation from such institutions must be presented to the Dean of the Faculty by the candidate in order to secure exemption from the examination, which will be in writing and will cover the ordinary branches of an English education.

Examinations will be held at 2 P. M., on Friday and Saturday, September 28 and 29, 1877. Candidates are required to present themselves on one of these days, as they are expected to be in attendance upon the first day of the term, at which time the regular course of instruction will commence. To provide for cases in which it is absolutely impossible for the candidate to be present at this time, supplementary examinations will be held at such times as may be determined upon by the Faculty, but no excuse except of an urgent character will be accepted for failure to appear at the first examination. Certificates of attendance are given for the actual period of attendance only.

Before admission to examination every student is required to present to the Dean of the Faculty the Steward's receipt for the payment of the annual dues. It will therefore be necessary for the candidate to apply first to the Steward at his office in the University Hall, register his name as a student in the Dental College, and pay his fees. In case of rejection the moneys paid preliminary to examination will be refunded by the Steward.

IV. ADVANTAGES OF CONNECTION WITH THE UNIVERSITY.

The Department of Medicine and Surgery, long in successful operation, offers in full the facilities required for the satisfactory study of all branches common to General Medicine and this specialty. These facilities may be concisely enumerated as follows:

I.—CHEMISTRY.

Recognizing the important part chemical agents play in the diseases of the dental apparatus, the dental student will attend the lectures on inorganic and organic chemistry, besides which he may enjoy the advantage of the chemical laboratory, for the practical study of all those agents or secretions that concern his future needs in the prevention and cure of disease.

The laboratory is a building devoted exclusively to chemistry, furnished with all needed apparatus for any kind of research that may be required. For details of chemical work see page 78.

II.—MATERIA MEDICA AND THERAPEUTICS.

Under this head will be brought in review all the remedial agents the dentist will need to use, with the fundamental principles which will guide their application in practice.

III.—ANATOMY.

The groundwork of our science, the importance of which to the dentist cannot be over estimated, will be studied demonstratively and practically. Besides the full course on anatomy which the student will attend with the medical class, special instruction will be given in the anatomy and histology of all that appertains to the oral apparatus. Thereby the dental student can become thoroughly acquainted with the region of his future professional practice, and in this study he must actively participate to make his knowledge of these parts complete.

IV.—PHYSIOLOGY.

Will be so fully discussed and illustrated that the attentive student cannot fail to understand this indispensable foundation for all subsequent study of pathology.

V.—PATHOLOGY AND PRACTICE.

The lectures on pathology and practice of medicine, always thorough and exhaustive in regular medical lectures, will furnish ample means for becoming acquainted not only with the principles but with the details of application.

VI.—SURGERY.

A complete course in this essential branch will fully meet the dentist's needs in the discussion of all surgical diseases, as well as the great underlying principles of surgical practice wherever applied.

VII.—DISEASES OF WOMEN.

Knowing how seriously the conditions of maternity and the provisions therefor often disturb the system, the dental student will be profited by the instruction given in the obstetrical and allied lectures.

In short, we consider the advantages which are offered by a fully equipped medical college of the first importance to the student of dental science, and we regard the attendance upon at least one entire course of medical lectures as the proper foundation for the subsequent study of a specialty. The student may here avail himself of all these facilities for a thorough education, in which the needs of a dentist will receive appropriate consideration.

V. OPERATIVE DENTISTRY.

In this department will be presented the principles involved in the treatment of, and operation upon, the natural teeth and adjacent parts, for their preservation and restoration to health when diseased. This will embrace not only attention to the various affections of the teeth and contiguous parts, but the character and application of the special remedial agents, and the various approved methods of operating in all the details of condition, materials, instruments and appliances.

The student will be required to make his attainment thorough upon all these particulars, in order that he may never be at a loss for a guide in his treatment and manipulation.

VI. CLINICAL.

In this department the aim will be to give the most thorough practical instructions in the operative details, and in the preparations of the instruments and appliances used.

The operating rooms are ample, and well arranged, and fully supplied with all the requisite facilities, such as chairs, engines, etc. All valuable appliances will be made available and instructions in their use given.

Every member of the senior class, at least, will be required to spend a part of each day in the clinic room.

Our experience thus far (two sessions) gives great encouragement for this part of the work, especially in respect to supply of material, and opportunities afforded to the students for practical work. There was in the beginning some solicitude in reference to clinical facilities, and some apprehension was expressed that there would be deficiency in this respect;. but this has been shown to be groundless. The applications which have been made for service, during the past terms, have been many more than could receive attention; and those applying for treatment and operations were persons who appreciate and value their teeth and have been accustomed to receive the attention of skilled operators. This is regarded as a matter of very great importance to the students; since it affords a valuable stimulus to them, and places salutary restrictions upon them.

VII. MECHANICAL DENTISTRY.

The instruction in this department will embrace everything that will enable the dentist to meet successfully the requirements in supplying substitutes for lost dental organs.

Special reference will be given to the principles involved in the restoration of voice and natural expression of the features.

Practical and valuable modes will be taught, and no time will be wasted upon worthless and obsolete styles.

The students will be required to supply themselves with necessary tools and appliances for the Laboratory.

Special attention will be given to the manipulation and management of the precious metals with reference to their application to dental purposes.

VIII. COURSE OF STUDY.

In the establishment of a College of Dental Surgery in the University, the aim has been to make the curriculum such as will meet the requirements of the students, and the expectations of the dental profession, and promise the largest measure of benefit to the public.

In organizing our new enterprise, we have desired to secure the most efficient means for attaining our object. It is generally conceded that graded and progressive work promises the best results in education; and in accordance with that view, the following classification of studies has been adopted.

For the Junior Year—Anatomy, including dissections, Physiology, Elementary Chemistry, Materia Medica and Mechanical Dentistry. These branches must be studied by means of lectures, text-books, and demonstrations. Members of the Junior class may hear the lectures of the Senior course when opportunity offers. Upon the branches above indicated the Juniors shall stand an examination at the end of the first term. The character of this examination will determine the entrance to the Senior class. Prior to this examination each student shall make and deposit in the College an artificial denture that shall be approved by the teacher in that branch, and also present a satisfactory practical denture made by himself.

The Senior Year—Shall embrace a review of the studies of the Junior year, Pathology, including diseases of women and children, Therapeutics, General, and Special Surgery, Analytical Chemistry, and Operative Dentistry.

In order to obtain greater proficiency a course of three years, embracing three sessions, is recommended. Such course would occupy a session between the Junior and Senior years, an intermediate year. For those who take this course some modification of the present arrangement of studies will be made.

IX. AIDS TO INSTRUCTION.

In addition to these details it is proper to state that the museum of the medical college, so well supplied with all things necessary for the medical student, is already rich in material to aid the dentist, and will be further increased by important additions at no distant day. The museum is constantly used in illustrating lectures, and is always open to students. The University museum also contains more than 250,000 scientific specimens, and is accessible to all who desire its advantages.

The University library is open daily, offering its advantages, with about 1,600 volumes of medical literature, to all who desire to use it, and a library of dental science will be speedily supplied. Students who can command the time may also avail themselves of numerous lectures, or pursue elective studies, limited only by their capacity for appropriating what is so abundantly offered.

X. GRADUATION.

The candidate must be twenty-one years of age. He must furnish evidence of good moral character. He must have devoted three years to the study of his profession, and have made such attainments in all the branches of the course of study herein indicated as shall be satisfactory to the Faculty. He must attend two full courses of lectures in the Dental College, or one course elsewhere, and the last one here, and we recommend that he attend these courses regularly. He must pursue the study of Chemistry in the Laboratory, or sustain an examination in the studies there pursued. He must submit to the Faculty a thesis upon some subject of his course. He must present for inspection practical operations prepared by himself in the College, and give evidence of his skill and ability in treating those derangements which may be submitted to his care. He must sustain an examination satisfactory to the Faculty in all the branches taught.

A graduate of the Medical College may enter the Senior class, and, if found qualified, may graduate after one year has been devoted exclusively to the study of Dentistry.

XI. TEXT-BOOKS.

OPERATIVE DENTISTRY.—Taft's Operative Dentistry, Harris' Principles and Practice of Dental Science, Wood's Dental Surgery.

MECHANICAL DENTISTRY.—Richardson's Mechanical Dentistry.

For books of reference on Medical subjects see page 101.

THE FACULTY

OF

THE DENTAL COLLEGE.

◆

JAMES B. ANGELL, LL. D.,

PRESIDENT.

JONATHAN TAFT, D. D. S.,

Professor of the Principles and Practice of Operative Dentistry.

DEAN OF THE FACULTY.

JOHN A. WATLING, D. D. S.,

Professor of Clinical and Mechanical Dentistry.

WALTER H. JACKSON, D. D. S.,

Demonstrator of Mechanical Dentistry.

STUDENTS.

Name.	Residence.	Preceptor.
Edwin E. Arnold,	*Lapeer,*	E. G. Douglas.
Geo. Washington Avery,	*Grand Rapids,*	M. D. Stoneman.
Hoyt Amos Avery,	*Austin, Minn.,*	J. M. Williams.
Wm. H. Baldwin,	*Toledo, Ohio,*	Harrower & Porter.
John N. Cowan,	*Ypsilanti,*	C. F. Ashley.
Samuel Finley Duncan,	*Knightstown, Ind.,*	J. W. White.
Thomas Sears Ewing,	*Dexter,*	Dr. Alex. Ewing.
Mark Florius Finley,	*Ypsilanti,*	J. A. Watling.
Clark S. Gregory,	*Albion,*	S. A. Gerry.
Homer B. Hackedorn,	*Lima, Ohio,*	George Hall.
Samuel B. Hartman,	*Fort Wayne, Ind.,*	S. B. Brown.
John Leonard Hodgman,	*Carson City,*	J. H. Bryant.
Marion Holland,	*St. Joseph,*	Faculty.
George Hugh Irvin,	*Lima, Ohio,*	George Hall.
Victor Hugo Jackson,	*Ann Arbor.*	W. H. Jackson.
James H. Kennicott,	*Chicago, Ill.,*	J. A. Kennicott.
Palemon John Kester,	*Chicago, Ill.,*	G. H. Hale.
Ulrich Kreit,	*Detroit,*	Moore & Cleland.
Fremont Ernest Lyon,	*Akron, Ohio,*	M. Chapman.
James McGregor,	*Detroit,*	J. A. Watling.
Peter McGregor,	*Ann Arbor,*	W. McGregor.
Benj. Franklin Miller,	*Ypsilanti.*	J. A. Watling.
William Henry Miller,	*Columbiana, Ohio.*	A. S. Sampsols.
William H. Nichols,	*Ann Arbor,*	Faculty.
Eben Levi Parker,	*Birmingham,*	C. T. Stroude.
Charles Francis Porter,	*Ann Arbor,*	C. B. Porter.
Charles W. Sanderson,	*Sinclairville, N. Y.,*	A. A. Stone.
Geo. Stephen Shattuck,	*Belle Plain, Iowa,*	Practitioner.
Charles Hensel Snyder,	*Mansfield, Ohio,*	L. W. Nevin.
Will Gilmore Stowell,	*Manchester,*	W. S. Stowell.
Philo J. Taylor,	*Wolcottville, Ind.,*	S B. Hartman.
John Lawrence Williams,	*Shreve, Ohio,*	J. W. Lyder.
George Henry Wilson,	*Painesville, Ohio,*	D. C. Wilson.

GENERAL LIBRARY
University of MICHIGAN

SUMMARY OF STUDENTS.

DEPARTMENT OF LITERATURE, SCIENCE, AND THE ARTS.*

Resident Graduates	14
Seniors	64
Juniors	73
Sophomores	71
Freshmen	132
In Selected Studies	15
Total	369

SCHOOL OF PHARMACY.

Second Year	29	
First Year	35	
		64

The Polytechnic School contains—

From the above Departments 124

DEPARTMENT OF LAW.

Seniors	124	
Juniors	185	
		309

DEPARTMENT OF MEDICINE AND SURGERY.

Students—Total	285

HOMŒOPATHIC MEDICAL COLLEGE.

Students—Total	51

DENTAL COLLEGE.

Students—Total	33
	1111
Deduct name twice mentioned	1
Total in the University	1110

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* Heretofore the students in the School of Pharmacy (now a separate School) have been counted in the Department of Science, Literature, and the Arts.

SUMMARY, BY STATES,

IN DEPARTMENTS AND IN CLASSES.

STATES AND COUNTRIES.	Resident Graduates.	Seniors.	Juniors.	Sophomores.	Freshmen.	Select.	Total in Literary Department.	Pharmacy.	Medical.	Law.	Homœopathy.	Dental.	Total in University.
Michigan	7	42	45	44	93	7	238	32	130	130	35	17	582
Illinois	1	6	6	5	13	--	31	5	15	46	4	2	103
Ohio	1	3	2	3	4	3	16	6	12	29	1	8	72
New York	--	5	2	5	2	--	14	10	32	9	5	1	71
Pennsylvania	--	2	2	1	3	1	9	1	17	12	2	--	41
Indiana	1	--	2	4	3	1	11	2	13	8	--	3	37
Wisconsin	--	1	2	3	4	2	12	4	7	5	2	--	30
Ontario, Canada	--	--	--	--	--	--	----	1	22	3	1	--	27
Minnesota	--	1	--	--	1	--	2	--	5	9	--	1	17
Iowa	3	1	3	1	1	--	9	--	2	4	--	1	16
Missouri	--	--	--	--	2	--	2	1	2	8	--	--	13
Kansas	--	--	--	1	1	--	2	--	2	9	--	--	13
Massachusetts	--	--	1	1	--	--	2	1	9	1	--	--	13
California	--	--	2	--	--	1	3	--	1	5	--	--	9
Kentucky	--	--	1	1	1	--	3	--	--	5	--	--	8
Vermont	--	1	--	--	--	--	1	--	2	3	--	--	6
Connecticut	--	--	--	--	--	--	----	--	4	--	1	--	5
Arkansas	--	--	--	--	1	--	1	--	--	4	--	--	5
Texas	--	--	1	1	1	--	3	1	--	1	--	--	5
Oregon	--	--	--	--	--	--	----	--	--	5	--	--	5
Nebraska	--	--	--	--	--	--	----	--	3	1	--	--	4
New Jersey	--	1	--	--	--	--	1	--	1	1	--	--	3
Delaware	--	--	1	--	--	--	1	--	1	1	--	--	3
West Virginia	--	--	--	--	--	--	----	--	--	3	--	--	3
New Hampshire	1	1	--	--	--	--	2	--	--	1	--	--	3
Rhode Island	--	--	1	--	--	--	1	--	2	--	--	--	3
Colorado	--	--	1	--	2	--	3	--	--	--	--	--	3
Utah Territory	--	--	--	--	--	--	----	--	--	2	--	--	2
Maryland	--	--	--	1	--	--	1	--	--	--	--	--	1
Mississippi	--	--	--	--	--	--	----	--	--	1	--	--	1
Louisiana	--	--	1	--	--	--	----	--	--	--	--	--	1
Tennessee	--	--	--	--	--	--	----	--	--	1	--	--	1
Maine	--	--	--	--	--	--	----	--	1	--	--	--	1
Washington Territory	--	--	--	--	--	--	----	--	--	1	--	--	1
Russia	--	--	--	--	--	--	----	--	1	--	--	--	1
Armenia, Asia	--	--	--	--	--	--	----	--	1	--	--	--	1
Japan	--	--	--	--	--	--	----	--	--	1	--	--	1
Total	14	64	73	71	132	15	369	64	285	309	51	33	1111

CALENDAR

OF THE

UNIVERSITY OF MICHIGAN

FOR

1877-8.

ANN ARBOR:
PUBLISHED BY THE UNIVERSITY.
1878.

ANN ARBOR PRINTING AND PUBLISHING COMPANY.

ANNOUNCEMENTS FOR 1878.

January	8.	University Exercises resumed after Holiday Vacation.
February	11.	*Semi-Annual Examinations begin.*
February	15.	*First Semester closes.*
February	18.	*Second Semester begins.*
March	11.	Juniors (Cl. and L. and Sc. courses) resume Latin.
March	26.	(Evening.) Recess of one week begins.
March	26.	The Law School and the Dental School close. The Short Term in the Medical Colleges ends.
March	27.	Commencement of Professional Schools.
April	8.	Sophomores (Cl. and L. and Sc. Courses) begin History (elected).
April	8.	Sophomores (L. and Sc. Course) begin Geometrical Drawing (elected).
April	15.	Juniors (Cl. Course) resume French.
April	22.	Middle of the Semester.
April	22.	Sophomores (Sc. Course) begin History.
April	22.	Sophomores (Sc. Course) begin Free-hand Drawing.
April	22.	Sophomores (L. and Sc. Course) begin Descriptive Geometry.
May	6.	Sophomores (Eng. Courses) begin Descriptive Astronomy.
May	25.	Juniors (Eng. Courses) begin Field Work.
May	28–29.	Examination of Seniors.
June	19–21.	*Semi-Annual Examination.*
June	22–24.	*Examination of Candidates for Admission.*
June	23.	*Baccalaureate Address.*
June	25.	Class-Day.
June	26.	Alumni Day.

June	27.	Commencement. Summer Vacation begins.
Sept.	19-24.	*Examination of Candidates for Admission.*
Sept.	25.	First Semester begins.
October	1.	Professional Schools open.
November	25.	Middle of Semester.
November	25.	Sophomores (Sc. Course) begin Zoölogy.
November	25.	Freshmen (Sc. and Eng. Courses) begin Geometrical Drawing.
November	—.	Thanksgiving Recess of three days, beginning Tuesday evening.
December	20.	(Evening). Holiday Vacation of Professional Schools begins.
December	20.	(Evening). Holiday Vacation of the Literary Department begins.
1879.		
January	7.	Exercises of the Literary Department resumed.
January	7.	Exercises of the Professional Schools resumed.
February	10.	*Semi-Annual Examinations begin.*
February	14.	(Evening.) First Semester closes.

BOARD OF REGENTS.[*]

JAMES B. ANGELL, LL. D.,
PRESIDENT.

NAME.	RESIDENCE.	TERM EXPIRES.
HON. CLAUDIUS B. GRANT,	*Houghton,*	1880
HON. CHARLES RYND,	*Adrian,*	1880
HON. EDWARD C. WALKER,	*Detroit,*	1882
HON. ANDREW CLIMIE,	*Leonidas,*	1882
HON. BYRON M. CUTCHEON,	*Manistee,*	1884
HON. SAMUEL S. WALKER,	*St. Johns,*	1884
HON. GEORGE DUFFIELD, D. D.,	*Lansing,*	1886
HON. GEORGE L. MALTZ,	*Alpena,*	1886

HENRY D. BENNETT,
SECRETARY AND STEWARD.

HON. J. M. WHEELER, M. A.,
TREASURER.

HORACE S. TARBELL, M. A.,
SUPERINTENDENT OF PUBLIC INSTRUCTION.

BOARD OF VISITORS.

D. O. FARRAND, M. D.,	*Detroit.*
REV. SAMUEL GRAVES, D. D.,	*Grand Rapids.*
CHARLES W. CLISBIE, Esq.,	*Cassopolis.*

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[*] In January, 1877, Hon. J. H. McGowan resigned his office of Regent, and Hon. Victory P. Collier was appointed for the unexpired term. Mr. Collier resigned in October and Rev. George Duffield, D. D., of Lansing, was appointed in his stead. In Janury, 1878, Mr. Collier, who had been elected to serve for eight years from that date, again resigned and Dr. Duffield was again appointed to fill the vacancy.

JOSEPH B. STEERE, Ph. D.,
Assistant Professor of Zoölogy and Paleontology.

ISAAC N. DEMMON, M. A.,
Assistant Professor of Rhetoric and History.

ELISHA JONES, M. A.,
Acting Assistant Professor of Greek.

JAMES G. GILCHRIST, M. D.,
Lecturer on Surgical Therapeutics in the Homœopathic Medical College.

CHARLES GATCHELL, M. D.,
Lecturer on Theory and Practice of Medicine in the Homœopathic Medical College.

RAYMOND C. DAVIS,
Librarian.

P. R. B. De PONT, B. A., B. S.,
Instructor in French.

CHARLES S. DENISON, M. S., C. E.,
Instructor in Engineering and Drawing and Assistant in Architecture.

ALFRED HENNEQUIN, M. A.,*
Instructor in French and German.

CHARLES N. JONES, B. A.,*
Instructor in Mathematics.

VOLNEY M. SPALDING, M. A.,
Instructor in Zoölogy and Botany.

OTIS C. JOHNSON, M. A.,
Assistant in Chemical Laboratory (Qualitative Analysis) and Purchasing Agent.

SAMUEL T. DOUGLAS, Ph. B., Ph. C.,
Assistant in Chemical Laboratory (Quantitative Analysis.)

WILLIAM J. HERDMAN, M. A., M. D.,
Demonstrator of Anatomy.

ABRAM V. E. YOUNG, Ph. B., Ph. C.,*
Assistant in Chemistry and Physics.

VICTOR C. VAUGHAN, Ph. D.,
Assistant in Chemical Laboratory.

HENRY B. PARSONS, Ph. C.,
Assistant in Chemical Laboratory.

KATE CRANE, Ph. C.,
Accountant in Chemical Laboratory.

LOUISA M. REED, M. S.,
Assistant in Microscopical Botany.

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*Absent on leave.

CHARLES H. STOWELL, M. D.,
Instructor in Physiological Laboratory.

WILLIAM H. DORRANCE,
Demonstrator of Dentistry.

ELIZABETH M. FARRAND,
Assistant Librarian.

DENNIE J. HIGLEY. M. A.,
Assistant in Museum.

ALEXANDER C. MACLEAN, M. D.,
Hospital Surgeon.

DOUGLAS A. JOY, M. E.,
Assistant in General Chemistry.

HENRY STECHER,
Assistant in Chemical Laboratory.

ASSISTANTS IN THE DEPARTMENT OF MEDICINE AND SURGERY.

GEORGE A. HENDRICKS, M. S., M. D.,
Assistant Demonstrator of Anatomy.

CHARLES W. WOOLDRIDGE, B. S., M. D.,
Assistant Demonstrator of Anatomy.

LUCIAN G. NORTH, M. D.,
Assistant to the Professor of Pathology and Practice of Medicine.

GEORGE BYRON AYRES, M. D.,
Assistant to the Professor of Anatomy.

CHARLES B. ALLYN, M. D.,
Assistant to the Professor of Materia Medica and Ophthalmic and Aural Surgery.

GEORGE W. KING, M. D.,
Assistant to the Professor of Surgery.

ASSISTANTS IN THE HOMŒOPATHIC MEDICAL COLLEGE.

GEORGE A. TABOR, M. D.,
Assistant to the Professor of Materia Medica and Therapeutics.

WILLIAM B. KNAPP, M. D.,
Assistant to the Lecturer on Surgery.

CHESTER S. HUBBARD, M. D.,
Assistant to the Lecturer on Theory and Practice of Medicine.

UNIVERSITY OF MICHIGAN.

THE UNIVERSITY AND THE STATE.

The University of Michigan is a part of the public educational system of the State. The Constitution of the State provides for the perpetuation of the governing body of the Institution, the Board of Regents. They are elected for terms of eight years by popular vote. In accordance with the law of the State the University aims to complete and crown the work which is begun in the public schools, by furnishing ample facilities for liberal education in Literature, Science, and the Arts, and for thorough professional study of Medicine, Law and Dentistry. Through the aid which has been received from the United States and from the State it is enabled to offer its privileges without charge of tuition, to all persons of either sex who are qualified for admission. Its relation to the public schools of the State has now become even closer and more vital than formerly, since under certain conditions the graduates of High Schools are received into the University without examination. While Michigan has endowed her University primarily for the higher education of her own sons and daughters, it must be understood that she also opens the doors of the Institution to all students, wherever their homes. Students from other States are asked to pay a larger admission fee than students from Michigan, but they receive their instruction and access to all the advantages of life at the University, without incurring any charge for tuition. It is in this broad generous, and hospitable spirit that the University has been founded, and that it endeavors to do its work.

ORGANIZATION OF THE UNIVERSITY.

The University comprises the Department of Literature, Science, and the Arts (including the School of Mines), the Department of Medicine and Surgery, the Department of Law, the School of Pharmacy, the Homœopathic Medical College and the Dental College. Each of these Departments and Colleges has its Faculty of Instruction, who are charged with the special management of it. The University Senate is composed of all the Faculties, and considers questions of common interest and importance to them all.

The Department of Literature, Science, and the Arts has six regular and full courses of four years each, namely, the Classical, the Scientific, the Latin and Scientific, the Greek and Scientific, the course in Civil Engineering, and the course in Mining Engineering. Post-Graduate courses are provided for the graduates of this University, or for the graduates of any College or University, who may desire to pursue advanced study whether for a second degree or not. Students who do not wish to pursue any one of the above courses may, if they are prepared to enter the University, pursue selected studies for such time, not less than one semester, as they may choose.

The school of Pharmacy is now established as a distinct School, and has a regular course of two years.

In the Department of Medicine and Surgery, the Department of Law, the Homœopathic Medical College and the Dental College, the instruction is given largely by lectures.

Students in any Department of the University may enter the classes in any other, upon obtaining permission from the faculties of the respective Departments.

THE LIBRARIES.

The University Library contains about 24,500 volumes, and over 7,000 pamphlets. In 1871 it was enlarged by the addition of the library of the late Prof. RAU, the distinguished Professor of Political Economy in the University of Heidelberg, Germany. The Rau Library was purchased by and presented to

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The Catalogue of the Library consists of two parts, a catalogue of titles on slips, arranged in the alphabetical order of the names of the authors, and a catalogue of the subjects treated in all the books and reviews and magazines in the Library. This catalogue is accessible to all persons who use the Library.

Ninety-eight American and European periodicals are taken by the Library, and fifty-four magazines and newspapers, representing nearly every part of the country, are kept upon the tables of the Library by the Students' Lecture Association.

The Library is open every week day from 9 o'clock A. M. to 5. P. M., and from 7 P. M. to 9½ P. M.

The Medical Library, containing about eighteen hundred volumes, is in the room of the General Library. Twenty-seven Medical Journals are regularly received.

The Law Library, kept in the second story of the Law Building, is open to the students of the Law Department, ten hours daily. It contains about three thousand five hundred volumes.

The two Literary Societies in the Department of Literature, Science, and the Arts, have also good Libraries.

The Christian Association connected with the University has a well selected Library of moral and religious works. Donations to this Library would be gladly received.

The libraries accessible to the students amount, in the aggregate to about 33,000 volumes.

THE ASTRONOMICAL OBSERVATORY.

The Observatory was founded by donations from citizens of Detroit. Valuable improvements and additions have been made by means of funds contributed from the same source, and also by the Regents of the University and the city of Ann Arbor. The building consists of a main part, with a movable dome, and two wings. The east wing contains the large meridian circle presented by Henry N. Walker, Esq., of Detroit. It was constructed by the famous makers, Pistor & Martins, of Berlin, and is one of the largest and best of the kind. The same room contains a sidereal clock, made by Tiede, of Berlin. and the collimators for the meridian circle. The west wing contains the library of the Observatory, and the smaller instruments. One of these is a chronograph with Bond's new isodynamic escapement, for recording observations by the electro-magnetic method. This wing connects with the residence of the Director. In the dome is mounted a large refracting telescope, with an object glass thirteen inches in diameter, constructed by the late Henry Fitz, of New York.

Through the liberality of the Legislature, means have been provided for the erection of a small Observatory for the purposes of instruction, on the Observatory grounds near the main building. This will be completed and fully equipped during the present year. It will contain an equatorial telescope of six inches aperture, and a transit instrument, with zenith-telescope attachment, so mounted as to be used either in the meridian or in the prime vertical. In the same enclosure is also a building containing computing rooms and rooms for observers, and a workshop where necessary repairs and attachments for the instruments can be made.

Students in the course of Civil Engineering will receive instruction in the use of portable astronomical instruments, and those who make astronomy an elective study during the Senior year, or in the University course, will receive instruction in the theory and use of instruments, and will have an opportunity to participate in the observations.

THE MUSEUM.

The collections in the University Museum are illustrative of Natural Science, Ethnology, Art, History, Agriculture, Anatomy and Materia Medica, and are constantly increasing. Prof. HARRINGTON, while connected with the United States expedition to the Aleutian Islands, secured important ethnological and other additions to the Museum. The whole of the valuable collection which Prof. STEERE made during his five years' explorations in South America, Formosa and the East Indies, has now arrived. The following description will indicate the character of the collections now in the museum.

I. NATURAL HISTORY.

I. A choice collection of MINERALS, numbering about six thousand specimens, embracing those (principally European) purchased of the late Baron LEDERER, and known as the LEDERER COLLECTION; and also a rich collection of the MINERAL SPECIES OF MICHIGAN, including all the varieties of Copper Ore and Associated Minerals from the different localities of the Lake Superior district. This collection is partly the fruit of the State Geological Survey, and partly the result of subsequent labors of Prof. DOUGLAS.

II. The collection in GEOLOGY consisting of:

1. The large and complete series of lithological and palæontological specimens brought together by the State Geological Surveys, of which over a hundred fossil species have already become the types of original descriptions.

2. The WHITE COLLECTION, consisting of 1,018 distinct entries and 6,000 specimens.

3. The ROMINGER COLLECTION, embracing about 2,500 entries and 6,000 specimens, mostly from the Mesozoic formations of Central Europe. This collection embraces about 500 specimens of Mesozoic Ammonites.

4. SMITHSONIAN DEPOSITS, consisting for the present of a collection of foreign and domestic specimens of building stones, and twenty-three specimens of fossils from the Upper Missouri.

5. MISCELLANEOUS DONATIONS AND COLLECTIONS, embracing more than four cases illustrating the metalliferous regions of the Upper Peninsula, collected by Prof. WINCHELL.

An interesting collection of fossils, chiefly cretaceous, from the Yellowstone Valley, presented by the late General CUSTER, U. S. A.

The entire Geological Cabinet is estimated to contain about 14,000 distinct entries and 41,000 specimens.

III. A very large ZOÖLOGICAL COLLECTION, consisting of:

1. A complete suit of the Birds which visit Michigan, with most of the Mammals of the State; a nearly complete series of the Reptiles found east of the Rocky Mountains; two thousand species of Mollusca, embracing all the land and fresh-water forms of the Northern and Western States, and a considerable collection of the Fishes and Radiata.

2. The TROWBRIDGE COLLECTION. This is a series of 1,856 entries (3,000 specimens) in most of the classes of the Animal Kingdom, made by Lieut. TROWBRIDGE, (formerly Professor in the University), upon the Pacific coast, with numerous additions from the interior and eastern portions of the Continent, supplied by the Smithsonian Institute.

3. A collection of about 5,000 Coleoptera and Lepidoptera from the estate of the late GEORGE L. AMES, M. D., of Niles.

4. SMITHSONIAN DEPOSITS, consisting of about 200 skins of birds from the Arctic Zone; 204 entries of marine shells from the Indo-Pacific and Panama, labelled by Mr. P. P. CARPENTER; 81 entries of Unionidæ; 250 entries of miscellaneous shells; in all, 535 entries of fresh-water and marine shells.

5. The STEERE ZOÖLOGICAL COLLECTION, comprising about 25,000 insects, 1,500 shells, 8,000 birds, and numerous representatives of other groups; total, about 10,000 entries and 60,000 specimens.

6. A collection of specimens illustrating COMPARATIVE ANATOMY. This collection contains several perfect, typical skeletons, and comprises 250 species, 1,000 specimens.

7. MISCELLANEOUS COLLECTIONS AND DONATIONS. The whole number of entries in the Zoölogical Cabinet is about 23,250, and the whole number of specimens over 110,000.

IV. A BOTANICAL COLLECTION, consisting of:

1. The plants of the State, collected by the public surveys, and numbering about 1,175 species, 1,500 entries, and 9,000 specimens.

2. The Houghton Herbarium, collected by the late Prof. Douglas Houghton, M. D., and presented to the University by his widow, the late Mrs. R. R. Richards. It consists of 28 folio cases of dried and labelled plants from various parts of the United States, and is estimated to contain 1,800 species.

3. The Sager Herbarium, presented by Prof. Abram Sager, and containing about 1,200 species and 5,000 specimens, collected mostly in the New England and Western States.

4. The Dr. Ames Herbarium, consisting of a serial collection of 7,000 specimens, and 10,500 duplicates, presented by the family of the late Dr. Ames, of Niles, Michigan.

5. A collection of Alaskan plants, presented by Capt. W. H. Dall, of the U. S. Coast Survey.

6. A collection of 2,000 species of plants, presented by Prof. M. W. Harrington.

7. A collection of 225 species of mosses from Central Europe, presented by Prof. Paul Reinsch, Erlangen, Bavaria.

8. A collection of 408 species, over 800 specimens of Algæ, from Mr. Horace Averill.

9. The Steere Botanical Collection, which comprises 500 species, 2,500 specimens, mostly ferns.

10. The Adams Jewett Collection, consisting of 2,500 species, 5,000 specimens. This collection was a part of the estate of Adams Jewett, M. D., of Dayton, Ohio, and was presented by his heirs, through H. S. Jewett, M. D., (1868), his son.

11. The Lemmon Collection of 460 species of California plants; presented by J. G. Lemmon.

12. A collection of 300 species from the Agricultural Department at Washington.

13. A collection of 3,000 German plants from S. S. Garrigues, State Salt Inspector, Saginaw.

14. A collection of truncheons of different varieties of woods from the United States, South America, China and other countries.

15. A collection of the seeds of native and cultivated plants.

The whole Botanical Cabinet contains 10,000 species, 20,000 entries and 70,000 specimens The Geological, Zoölogical and Botanical Cabinets together, are estimated to contain 60,000 separate entries, and 255,000 specimens.

II. ARCHÆOLOGY AND RELICS.

This Department of the Museum contains various articles of domestic and warlike use among the North American Indians, and the Islanders of the Sonth Pacific; numerous remains of the ancient Peruvians; many specimens of clothing, art, etc., of the Amazonian Indians, Modern Peruvians, Chinese, Formosans, and natives of the East Indies and Alaska; and sundry relics and memorials of the enterprises of Peace, as well as of our great Civil War. It seems eminently appropriate that the University of Michigan should make efforts to preserve memorials of the native tribes, so fast disappearing before the march of civilization; and it is earnestly hoped that this department of the Museum may be deemed a suitable place of deposit for any such relics in the possession of our citizens. A number of interesting relics from the Pacific Islands have been added by the Smithsonian Institute.

Efforts are making to found in the University a collection illustrating the materials, processes, and products of Agriculture and Horticulture. The nucleus of such a collection already exists in—1st, The Botanical and Zoölogical Cabinets, and the Cabinets of Economical Geology; 2d, A collection of the seeds of cereals and other field and garden crops; 3d. An interesting collection of textile fibres and various substitutes for cotton, received from the Department of Agriculture at Washington.

III. THE FINE ARTS AND HISTORY.

This collection was commenced in the year 1855, and at present comprises:

1. A gallery of Casts, in full size and in reduction, of the most valuable ancient Statues and Busts. These were mainly

executed at the imperial modeling establishment of the Louvre, by Desachy, of Paris, and by the Brothers Micheli, of Berlin.

2. A gallery of more than two hundred Reductions and Models, in terra cotta and other materials. These represent Statues, Portrait Busts, Vases, and other Antiquities in the Museo Borbonico and other European Museums. They were executed at Naples.

3. A gallery of Engravings and Photographic Views, executed in Italy and Greece, illustrating especially the architectural and sculptural remains of Ancient Rome, Pompeii, Paestum, Athens and Corinth.

4. The HORACE WHITE COLLECTION OF HISTORICAL MEDALLIONS, comprising, first—1st, Four hundred and fifty Casts from Antique Gems in the Royal Museum at Berlin, illustrative of Ancient History; 2d. Over five hundred Casts illustrative of Mediæval History and of the Renaissance Period; 3d. About four hundred Medallion Portraits of Leading Personages in Modern History.

5. A collection has been commenced of engraved copies of the great Masterpieces of modern painting, beginning with those prior to Raphael.

6. The Statue of Nydia, and of Ruth Gleaning, by Randolph Rogers.

7. In addition to the above are several copies of Modern Statues, Busts, and Reliefs, by Michael Angelo, Canova, Thorwaldsen, and others, the most valuable of which are copies in bronze of the Muses, and of the Augustino and Julian di Medici of Michael Angelo.

A new Catalogue of this Museum has recently been prepared with great care by Prof. FRIEZE.

IV. ANATOMY AND MATERIA MEDICA.

The University has become the owner of the valuable Anatomical Museum, formerly the property of Prof. FORD, the results of his labor for many years in the preparation and purchase of materials for the direct purpose of most successful teaching.

It embraces a valuable collection of bones, amply illustrating healthy as well as diseased conditions, likewise the various changes from infancy to old age.

It contains numerous skulls, teeth and other preparations of great interest and value, by which not only the structure, but also the various stages in the development of both temporary and permanent teeth are well illustrated; as well as many valuable exhibitions of diseases of the teeth and associated parts, furnishing the Dental student important aid in the prosecution of his studies.

The Arterial preparations are numerous, embracing complete and partial dissections, well preserved, exhibiting the normal as well as many abnormal arrangements of vessels, and furnishing ample facilities for studying the vascular system.

There are also models in Wax, Papier Mache, and Plaster of various parts of the body which they serve best to illustrate; and the Museum is rich in whatever can best advance the interests of the student.

The valuable collection of Prof. SAGER, illustrating the comparative craniology, neurology and embryology of the Vertebrata, and also the pathology and anatomy of the Diseases of Women, has been added to the property of the University, and to it accessions are annually made.

The department of the Museum illustrative of Materia Medica consists of a very complete set of crude Organic Medicinal substances, embracing between five and six hundred specimens, imported from Paris, put up in beautiful glass-covered half-gallon jars, of uniform appearance, finely displayed, and arranged according to their order in Natural History; besides about one thousand other specimens of Simple Mineral and Vegetable Substances, and Pharmaceutical and Officinal Preparations, Active Principles, etc., arranged in groups convenient for study.

Besides these actual specimens, Medical Botany is illustrated by between one hundred and two hundred large and finely colored Plates, framed and glazed and displayed for observation.

All the above collections are arranged in galleries, for the purpose of rendering them accessible both to students and visitors. The University thus affords a secure depository for objects of value and curiosity, and it is therefore to be hoped that the Museum will receive accessions by donations from various sources.

DEGREES AND POST GRADUATE COURSES.

The Degree of Mining Engineer is conferred upon students who complete the course and pass the examinations in the School of Mines.

The Degree of Civil Engineer is conferred upon students who complete the course of Civil Engineering, and pass the examinations in the same.

The Degree of Pharmaceutical Chemist is conferred upon students who complete the course and pass the examinations in the School of Pharmacy.

The Degree of Bachelor of Arts is conferred upon students who complete the Classical Course, and pass the examinations in the same.

The Degree of Bachelor of Philosophy is conferred upon the students who complete the Latin and Scientific Course, or the Greek and Scientific Course, and pass the examinations in the same.

The Degree of Bachelor of Science is conferred upon students who complete the Scientific Course, and pass the examinations in the same.

The Degrees of Doctor of Medicine, Bachelor of Laws and Doctor of Dental Surgery are conferred upon conditions which are given hereafter in the chapters descriptive of the Professional Schools.

The Degrees of Master of Arts, Master of Philosophy and Master of Science will *henceforth be conferred only upon examination*, and according to the following conditions:

I. (1.) The candidate must be a graduate either of this or of some other collegiate institution empowered to confer degrees.

(2.) He must pursue at least for a year, two of the courses of post-graduate studies, designated in the programme on the following pages.

(3.) He must sustain an examination before the Faculty in at least three of the studies so attended—the studies to be elected by the candidate.

(4.) He must present a thesis to the Faculty on one of the subjects chosen for examination.

The second Degree may thus be obtained, on examination, one year after the first Degree.

The higher courses will not be restricted to graduates and candidates for the second degrees, but will be open to all who shall give satisfactory evidence of ability to profit by them.

II. These Degrees may be conferred respectively on BACHELORS OF ARTS, BACHELORS OF PHILOSOPHY and BACHELORS OF SCIENCE, graduates of the University, who have not resided here since graduation, but who at a date not earlier than two years after graduation shall, on examination, show special proficiency in literary or scientific studies, and shall present a satisfactory thesis to the Faculty.

III. The Degree of DOCTOR OF PHILOSOPHY is open to the graduates of the University, or of any other reputable University or College, who shall have satisfied the Faculty on examination that they have made special proficiency in some one branch of study, and good attainments in two other branches to be specified by the Faculty. They will be expected to reside here, and to perform an amount of work which will occupy at least two years. It is intended that the Degree of Doctor of Philosophy shall not be won merely by faithful and industrious work in some assigned course of study, but that the successful candidate shall evince power of original research, and of independent investigation.

Persons who are not graduates, will be received as candidates for this Degree, if they satisfy the Faculty that they have made attainments equivalent to those required here for the Degree of Bachelor of Arts, or Bachelor of Philosophy, or Bachelor of Science.

PROGRAMME OF STUDIES

FOR THE DEGREE OF M. A., M. P., AND M. S.

COURSE FOR THE FIRST SEMESTER.

Professor PRESCOTT—*Chemistry and Mineralogy*—A course of Qualitative Analysis and of Blow-pipe Analysis of Minerals.

Professor FRIEZE—*Latin Literature.*—The Roman Satirists.

Professor ADAMS—*History.*—The Growth of Liberty in England.

Professor WATSON—*Astronomy.*—Numerical Calculus; Theory of Interpolation and Quadratures; Method of the Least Squares.

Professor OLNEY—*Mathematics.*—Differential and Integral Calculus.

Professor D'OOGE—*Greek Language.*—History of Classical Philology.

Professor COCKER—*Logic.*—Its History and Actual Influence on Thought and Language.

Professor MORRIS—*French Literature.*

Professor GREENE—*Civil Engineering.*—Theory of Constructions.

Professor PETTEE—*Mineralogy and Lithology.*—A course of Determinative Mineralogy and Lithology.

Professor WEAD—*Physics.*—Theoretical Physics.

COURSES FOR THE SECOND SEMESTER.

Professor PRESCOTT—*Chemistry and Mineralogy.*—Course of Quantitative Analysis, with investigations, referring especially to the application of the Science to the Arts, Manufactures and Agriculture.

Professor FRIEZE—*Latin Literature.*—The Philosophical Writings of Cicero, and the Works of Seneca.

Professor ADAMS—*Constitutional History of the United States.*

Professor WATSON—*Calculations* of the Special and General Perturbations of Planets and Perturbations of Comets.

Professor OLNEY—*Mathematics.*—Calculus of Variations.

Professor D'OOGE—*Greek Literature.*—The Greek Lyric Poets.

Professor COCKER—*General Culture.*—Theory of Taste; History of Philosophy.

Professor MORRIS—*German Literature.*

Professor GREENE—*Civil Engineering.*—Theory of Machines; Hydraulics.

Professor WEAD—*Physics.*—Physical Manipulation and Practice.

EXPENSES.

The only charges made by the University are: To residents of Michigan, an admission fee of ten dollars, and the annual payment of twenty dollars; to those who come from other States or countries, an admission fee of twenty-five dollars, and the annual payment of twenty-five dollars. A by-law of the Board of Regents provides as follows:

Every student before entering any department of the University, shall pay to the Steward the sum of ten dollars, if a resident of Michigan, and the sum of twenty-five dollars, if from any other State or country, as a matriculation fee. Each student shall also pay to the Steward annually twenty dollars, if a resident of Michigan, and twenty-five dollars, if a resident of any other State or country, to be devoted to the payment of incidental expenses. Resident graduates are required to pay the same annual dues as undergraduates, and no student or graduate shall be allowed to enjoy the privileges of the University, except on presentation to the President of the Steward's receipt for all fees and dues specified in this or any other rule or regulation of the Board of Regents.

The name of no person shall be presented by any Faculty to the Board of Regents for a degree, till he has exhibited to the Faculty the receipt of the Steward for the payment of all dues, including the fee for diploma.

The admission fee is paid but once, and entitles the student to the privileges of permanent membership in any department of the University. The annual tax is paid the first year and every year thereafter.

There are no dormitories and no commons connected with the University. Students obtain board and lodging in private families for from three to five dollars per week. Clubs are also formed in which the cost of board is from one dollar and a half to two dollars and a half per week.

It is proper to say, in answer to numerous inquiries, that the University does not undertake to furnish manual labor to students. Yet a considerable number of the students find in the city opportunities for remunerative labor.

Room rent varies from seventy-five cents to two dollars a week for each student.

The annual expenses of students in the Academic Department for the last few years, *including clothing and incidentals*, have been on the average, about $370. The expenses of Professional students are from $150 to $200 per term of six months.

BY-LAWS CONCERNING ADMISSION.

I. To the Academic Department. Every candidate for admission, when coming from another Collegiate institution, shall exhibit a certificate of honorable dismission.

Every candidate for admission to the Freshman Class shall pass an examination satisfactory to the Faculty, in the preparatory studies as required by the rules: and every applicant for an advanced standing shall be examined not only in the preparatory course, but also in all the previous studies of the class which he proposes to enter.

No student can be admitted to the department whose age is less than sixteen years.

2. To the Law Department. No student shall be admitted to this department who has not attained the age of eighteen years, nor until he has presented to the Faculty evidence of good moral character.

3. To the Medical Department. Every candidate for admission shall exhibit to the Faculty satisfactory evidence of a good moral character, and of a good preparatory English education.

4. To the Homœopathic Medical College. The same requirements as in (3.)

5. To the Dental College. The same requirements as in (3.)

6. To the School of Pharmacy. The candidate must possess a good knowledge of the use of the English Language, as determined by written examination.

RELATIONS OF STUDENTS TO THE CITY GOVERNMENT.

Students are temporary residents of the city, and, like all other residents, are amenable to the laws. Whenever guilty of disorder or crime, they are liable to arrest, fine, and imprisonment, and can claim no peculiar exemption from public disgrace and legal penalties.

DEGREES CONFERRED

DURING THE YEAR.

PHARMACEUTICAL CHEMIST.

John Herbert Avery,
Gleason Fillmore Dixon,
William Howard Gates,
Will Frank Griffith,
Albert Adam Hallock,
Bagley A. Harris,
Theodore Hauck,
Frank Jackson Hubbard,
Kent P. Humiston,
Marion Eliza Johnson,
John Sleeper Johnson,
Joseph John Johnston,
Abram Pitcher Kerley,
David Kirk,
Victor Knapp,
Wm. Herbert Denston Lewis,
Arthur Stephen Laub,
Robert Logan,
William Lester Long,
Stanley Eli Parkhill,
Mary Elizabeth Post,
Elwood Morris Reed,
J. Hungerford Smith,
Ransom H. Stevens,
Clarence George Stone,
J. Warren Tompkins,
Hugh Sumner Wyman,
Arthur Lansing Young.

CIVIL ENGINEER.

Osmer Henry Aikine,
Holland William Baker,
William Burton, B. A.,
Benjamin Austin Richards,
Edward Johnson Snover,
James Edgar Turtle.

BACHELOR OF SCIENCE.

Alfred Allen Bennett,
Granville Williams Browning,
Lemuel Watson Clark,
Branch H. Colby,
William Barton Ferris,
Carlton Cassius Frederick,
Ellen Clara Hogeboom,
Frank Henry Kimball,
Hein Lankheet,
Joseph Rogers McLaughlin,
Milo Milton Potter.

BACHELOR OF PHILOSOPHY.

William Carpenter,
George Cary Comstock,
Lou Hughes,
Ortive E. Latham,

Percy Tyler Cook,
Thomas J. Eaman,
Mary Emma Farrand,
Ogden Winner Ferdon,
Lulu Goodrich,
Mary Louise Hall,
Albert William Hard,
Mary H. Hubbard,
Milo Lewis,
Emma Margaret Pugsley,
Willis Reed Roberts,
William Abel Satterlee,
Herbert Miner Slauson,
Ernest Franklin Smith,
Melancthon Lloyd Woolsey.

BACHELOR OF ARTS.

Joseph Sutton Ayres,
George Barnes,
Octavia Williams Bates,
George Stephen Bishop,
Albert Nelson Bliss,
Fred Leroy Bliss,
Charles Ankeny Bosworth,
George Preston Brown,
George Alonzo Cady,
Herbert Elwood Cary,
Carlos Bingham Cochran,
Clara M. Colman,
John Samuel Crombie,
Frank Clark Ferguson,
Joseph Henry Fiske,
Ferris Smith Fitch, Jr.,
Edward Ashley Gilbert,
John B. Glasgow,
William John Gray,
Edward Holmes Guyer,
Edward Anderson Halsey,
Harriet Amanda Holman,
Lawrence Cameron Hull,
Henry Towne Kent,
William Hurley Lightner,
Charles Emmett Lowrey,
Mary Olive Marston,
William McCarroll,
Ann Elizabeth McDonald,
Henry Clay McDougall,
Erastus Fletcher Mearkle,
William James Miller,
George Nathan Orcutt,
Lyndon Sanford Smith,
Edward Augustus Stevens,
Margaret Stewart,
Vernor Jerome Tefft,
J. George Van Winkle,
Frank French Williams,
Affia Jennie Wilson.

MASTER OF SCIENCE [ON EXAMINATION.]

Louisa Maria Reed, B. S.

MASTER OF PHILOSOPHY [ON EXAMINATION.]

Abram Sager Hall, Ph. B.

MASTER OF ARTS [ON EXAMINATION.]

Ludovic Estes, B. A.,
(Haverford College.)

Absalom Winfield Jones, M. A.
(Otterbein University.)

MASTER OF SCIENCE [IN COURSE.]

Delos Buzzell,
Wilhelmus Decker.

MASTER OF PHILOSOPHY [IN COURSE.]

Oshea Stowell Brigham,
Josephine Augusta Day,
Anna Minerva Chandler.

MASTER OF ARTS [IN COURSE.]

Charles Orrin Baker,
Fred Augustus Cady,
Oscar James Campbell,
John James Davis,
George Pinckney Glenn,
John Townsend Hall,
Hiram Hamilton,
George Lester Harding.
Almon Franklin Hoyt,
Richard Hudson,
Don Alonzo Matthews,
Fred Augustus Maynard,
Byron Booth Northrop.
Wilbur Fisk Reed,
Henry Wade Rogers,
William Smith Sheeran,
Chas. Cumming Stewart.
Calvin Thomas,
Wm. Henry Townsend,
Chas. McK. Van Cleve,
Edward Wm. Withey,
Edward White Wood.

DOCTOR OF MEDICINE [DEPARTMENT OF MEDICINE AND SURGERY.]

Charles Beckwith Allyn,
William W. Anderson,
Allion A. Andrews, B. S.,
Samuel Armstrong,
George B. Ayres, M. D.,
Ransom M. Barrows,
Orville B. Batchelder,
Charles Black, B. A.,
Benjamin D. Bradfield,
Alexander C. Burns,
Daniel Sinclair Campbell,
Harris Ansel Canfield,
John Edward Clark,
John J. Conner,
Jeremiah Coughlin, P. C.,
John Franklin Curry,
Edgerton Clapp David,
Julius W. Y. David,
Henry William Dennis.
George N. Newton.
Lucian Gregory North,
George William Orr.
George William Palmer.
Duncan Patterson,
Clarence E. Persons,
Wilbur Fisk Reed, B. A.,
Edward Adams Romig,
G. Irwin Royce.
William Russel,
Randall Schuyler, Jr.,
Jacob Danford Sherrick,
Elisha T. Shumacher,
Hollis Fred Sigler,
S. Whedon Smith, B. A., P. C.,
Samuel Seymour Stearns,
La Fayette Stuck,
Clarence Fletcher Smith,
James H. Travis,

Alfred Desjardins, M. A.,
John Benjamin Dudley,
John H. Dumon,
G. Dudley Elder.
Stephen Fugate,
George Whitfield Fury,
Leslie Medard Goodrich,
Fred. Eugene Grant,
Thomas E. W. Grover,
Henry P. Halsted, B. S.,
D. Claude Hawxhurst,
George H. Hendricks, M. S.,
I. Walker Houston,
Aaron Rood Ingram,
John Smith Ingram.
George Henry Jones,
George Weirs King,
James Johnson Lyon,
Alexander C. Maclean.
Jeremiah L. Maloney,
John M. McDonald,
William H. McKenzie,
Arthur Howard Moss,
Moses Newkirk.

Ashman H. Vandivert,
F. Eugene Walbridge,
George Watson,
Henry Mason Wheeler,
George James Wilder,
Charles W. Wooldridge, B. S.,

Eveline P. Ballintine,
Emma L. Benham,
Harriet V. Bills,
Amanda Conkling,
Ada J. Healey,
Mary L. Hoagland,
Euphemia J. Howell,
Juliet E. Marchant.
Eliza Mitchell,
Fanny Searls,
Julia E. Sparr,
Frances Augusta Tenney,
Elnora Upham Totten,
Abbie E. Vail,
Sophia Volland,
Lettie Helen Woodruff.

BACHELOR OF LAWS.

Morris Abeles,
Truman Edson Ames,
Oscar Edward Angstman, B. S.,
John Henry Baker,
Frank A. Baldwin,
Alton Will. Bennett,
James Winch Bucklin,
Thomas Bernard Buckner, B. S.,
Albert Burgess,
Otto Charles Butz,
Silas Horatio Callender.
James Wellington Carr,
Francis Grigsby Carpenter,
Edwin T. Cass,
Ira Wallace Castle,
George Warren Chamberlin,

Reuben H. Markham, B. A.,
Hattie Mason,
Richard Louis McDougall,
Cassius Dixon McEwen,
Joseph James McKee,
Francis R. McKennon,
E. William Loren McLaughlin,
John Andrew McMahon,
Donald McPherson, B. S.,
Erastus F. Mearkle,
John Michell,
Samuel Murphy,
Charles Bruce Moores, B. A.,
Samuel Johnson Nelson,
Henry Ohrns, Jr.,
Charles Wallace Perry,

William Asbury Chase,
William Tucker Coad,
Alfred James Coates,
Charles Louis Colvin,
John Connor,
Thomas C. Conrad,
Charles Wilkins Cox,
Thomas R. Crisup,
John W. Creveling, B. A.,
Adelbert Culver,
William Tell DeBann,
Charles N. Dolson,
Melville Cox Ebright,
James Clarence Ellis,
Arnold W. Eschenburg,
William Henry Fairchild,
Frank Levi Fales,
S. Olin Foster,
Lucius W. Fraser,
Isaac Andrew Gilbert,
William D. Gilbert, B. A.,
Charles Pierce Gilchrist, B. A.,
Daniel Virgil Gore,
Edward Alonzo Gott, Ph. B.,
Darwin C. Griffin,
Gerald Griffin,
Hugh De Loss Grigsby,
Matthew Franklin Guinon,
Frank Darius Hale,
William Irving Hamilton,
William Henry Harris,
Whitman T. Hines,
William T. Hodson,
Charles Ripley Hopson,
Robert Hovenden, M. A.,
D. Darwin Hughes, Jr.,
Lucius D. Johnson,
Francis Everett Jones,
W. Scott Judy,
Francis Marion Landram,
Frank A. Larzelere,
Myron Chatham Lingle,
Charles Leonidas Phelps,
Frederick B. Phillips,
Herman Pistorius,
Walter Scott Powers,
Frank A. Reid,
Frank George Reynolds,
Claudius M. Rivers,
James C. Reiger,
Millard F. Riggle,
Reuben Roof,
Dudley P. Safford, B. A.,
Theodore Stanfield Shaw,
John Evans Simonson, B. S.,
Seymour C. Spencer,
George Milton Sprout,
Calvin C. Staley,
Ashbel Greene Stiner,
Robert W. Stewart,
Louis Stifel,
Samuel Calvin Stough,
Frank Hammond Sweet,
James Tait,
John Lafayette Talbot,
Arthur Bruce Taylor,
William B. Taylor,
Louis Benner Tuller,
John A. Turner,
Frank Bortle Tuttle,
John Burgess Utt,
Samuel Waldo Vandivert,
Jeremiah Green Wallace,
William Watts,
William Henry Wells, B. A.,
Franklin Emory Wheaton,
G. Frank White,
Girdon O. Williams,
William Brown Williams, B. A.,
Ariel Newton Wilson,
Arion E. Wilson,
George Adolphus Wood,
Florentine C. Woodworth,
John W. Yerkes, B. A.,

Medary Dale Mann,
Nathan Abijah Mann,
Ralph Norris Marble,
Bertrand Dealton York,
Alfales Young,
Frank E. Young.

DOCTOR OF MEDICINE. [HOMŒOPATHIC MEDICAL COLLEGE.]

Erasmus Edwin Adams,
J. Albert Baker,
Patrick Henry Bumpus,
Juliet Caldwell,
Charles Hercules Dale,
Sarah P. Engle,
John Oscar Garmon,
Chester P. Hubbard,
Charles Perry Miller,
Rollin Charles Olin,
Warren Harvey Rand,
Alexander Hamilton Rogers,
George Albert Taylor,

DOCTOR OF DENTAL SURGERY.

S. Brenton Hartman,
John L. Hodgman,
Marion Holland,
George Hugh Irvin,
Victor Hugo Jackson,
Palemon John Kester,
Ulrich Kreit,
Peter McGregor,
George Stephen Shattuck,
Will Gilman Stowell.

DEPARTMENT

OF

Literature, Science, and The Arts.

REQUIREMENTS FOR ADMISSION.

All candidates for admission to the Freshman Class must be at least sixteen years of age, and must present satisfactory evidence of good moral character.

I. CLASSICAL COURSE.

Candidates for this course will be examined in the following studies:

1. English Language.—Each candidate will be required to write not less than two pages (foolscap), correct in spelling, punctuation, capital letters, grammar, and division into paragraphs, on a subject to be assigned at the time of the examination. The subject for 1878 will be taken from one of the following works: Shakespeare's Julius Cæsar, or Tempest; Scott's Old Mortality, or Kenilworth; Dickens's Christmas Stories.

2. Geography.—General facts of Physical Geography, the Political Geography of Europe and the United States, and Ancient Geography, particularly that of Italy, Greece and Asia Minor.

3. History.—In Grecian History, the first *three* books of Smith's History of Greece, exclusive of the chapters on Literature and Art; an outline of Roman History, from the foundation of the city to the Battle of Actium; and of the History of the United States to the close of the Revolutionary War.

		CLASSICAL COURSE.	SCI
FRESHMAN.	1st SEMESTER.	LATIN:—1……1st Div. 9½, 2d Div. 11½. GREEK:—1……2d Div. 10½, 1st Div. 11½. MATH.:—1……1st Div. 8¼, 2d Div. 9½. ENGLISH EXERCISES: †……Fridays, 1st Div. 10½, 2d Div. 11½.	ENGLISH LAN GEOM. DRAW FRENCH:—1.. MATH.:—1..... ENGLISH EXE
	2d SEMESTER.	LATIN:—1……1st Div. 9½, 2d Div. 11½. GREEK:—1……2d Div. 10½, 1st Div. 11½. MATH.:—1……1st Div. 8¼, 2d Div. 9½. ENGLISH EXERCISES:……Fridays, 1st Div. 10½, 2d Div. 11½.	MATH.:—1...... FRENCH:—1.... DESC. GEOM.:— BOTANY:—1-2.. ENGLISH EXER
SOPHOMORE.	1st SEMESTER.	LATIN:—1-2……10½. GREEK:—1-2……8¼. ENGLISH LITERATURE:—1-2……3. RHETORIC:—1-2……3. MATH.:—1……1st Div. 10½, 2d Div. 11½. ESSAYS: †……Mondays and Tuesdays, 2.	ZOÖLOGY:—1...... FRENCH:—1....... MATH.:—1.......... ESSAYS:.............
	2d SEMESTER.	LATIN:—1……1st Div. 9½, 2d Div. 10½. GREEK:—1……2d Div. 9½, 1st Div. 10½. MATH.:—6 w……1st Div. 3, 2d Div. 2. MATH. or HISTORY:—1 less 6 w……3. ESSAYS:……Mondays and Tuesdays, 2.	MATH.:—1-2....... FREE-HAND DRA or PERSPECTIVE:- ENG. LIT.:—1-2..... RHETORIC:—1-2... FRENCH:—1-2...... HISTORY:—1-2..... ESSAYS:..............
JUNIOR.	1st SEMESTER.	PHYSICS:—1……1st Div. 9½, 2d Div. 11½. HISTORY:—6 w……3. GREEK:—1 less 6 w……3. FRENCH:—1……1st Div. 8¼, 2d Div. 9½. *Speeches*:—Elective……4 to 6.	PHYSICS:—1.......... BIOLOGY:—1 less 6 or SURVEYING:—1 1 HISTORY:—6 w...... GERMAN:—1.............. *Speeches*:—Elective....
	2d SEMESTER.	CHEMISTRY:—1……11½. GREEK:—3 w……3. LATIN:—1 less 3 w……9½. DESC. ASTRONOMY:—2-5……10½. FRENCH:—3-5……9½. *Speeches*:—Elective……4 to 6.	CHEMISTRY:—1........ GERMAN:—1........... or ANAL. MECHANIC or LAB. PHYSICS:—1 DESC. ASTRONOMY:- ZOÖLOGY:—3-5........ *Speeches*:—Elective..
SENIOR.	1st SEMESTER.	LOGIC AND PSYCHOLOGY:—1……9½. Electives. *Latin and Greek*:—1……11½. *German*:—1……10½. *English Literature*:—1-2……4. *Political Economy*:—1-2……3. *History*:—1……4. *Chemistry*:—1……2 to 4. *Astronomy*:—1……2. *Surveying*:—1……8¼ to 12½. *Zoölogy*:—1……8¼. *Botany*:—1……8¼. *Mineral. and Lithol.*:—1……10½.	LOGIC AND PSYCH Electives. *French*:—1-2......... *German*:—1.......... *English Literature*: *Political Economy*: *History*:—1 .... *Chemistry*:—1....... *Astronomy*:—1...... *Zoölogy*:—1......... *Botany*:—1.......... *Mineral. and Lit*
	2d SEMESTER.	Electives. *Moral Phil. and History of Phil.*:—1……9½. *Latin and Greek*:—1……11½. *German*:—1……10½. *French*:—3-5……11½. *Italian or Spanish*:—2-5……5. *English Literature*:—1-2……4. *International Law*:—1-2……3. *History*:—1……4. *Chemistry*:—1……2 to 4. *Astronomy*:—1……2. *Zoölogy*:—1……8¼. *Botany*:—1……8¼. *Geology*:—1……11½. *Laboratory Physics*:—1……2 to 4.	Electives. *Moral Phil. and* *German*:—1...... *Italian or Span* *English Literatu* *International La* *History*:—1...... *Chemistry*:—1... *Astronomy*:—1.. *Zoölogy*:—1...... *Botany*:—1...... *Geology*:—1..... *Laboratory Ph* -1..

NTIFI OURSE.	LATIN AND SCIENTIFIC COURSE.*	
CAGE:—1 ....3. G:—1-2 ....8¼ to 10½. ....9½. ....10½. RC ....Fridays, 2.	LATIN:—1........9½. FRENCH:—1........11½. MATH.:—1........10½. ENGLISH EXERCISES:........Fridays, 2.	ENGLISH L GEOM. DRA FRENCH:— MATH.:—1.. ENGLISH E
........11½. ....9½. 1-2........8¼. ....4. ISES:........Fridays, 3.	LATIN:—1........9½. FRENCH:—1........11½. MATH.:—1........10½. ENGLISH EXERCISES:........Fridays, 2.	MATH.:—1.. FRENCH:— DESC. GEO RHETORIC: FREE-HAND BOTANY:—C ENGLISH E
........11½. ....9½. ....3. .Wed ys and Thursdays, 2.	ZOÖLOGY:—1-2........10½. LATIN:—1-2........10½. FRENCH:—1........11½. MATH.:—1........9½. ESSAYS:........Wednesdays and Thursdays, 2.	PHYSICS:—1 TOPOG. DRA MACHINE MATH.:—1... ESSAYS:......
........2. ....10½. VING:— ....11½. —1-2.. ....3. ....3. ....9½. ....3. Vedne /s and Thursdays, 2.	LATIN:—1-2........1st Div. 9½, 2d Div. 10½. DESC. GEOM.:—1-2........9½. ENG. LIT.:—1-2........3. RHETORIC:—1-2........3. MATH.:—6 w........2. GEOM. DRAW.:—1 less 6 w........2 to 4, or MATH. or HISTORY:—1 less 6 w........3. ESSAYS:........Wednesdays and Thursdays, 2.	MATH.:—1.... CHEMISTRY: DESC. ASTRO SHADES AND OTOMY:—1 ESSAYS:......
Div. 9½, 2d Div. 11½. ....2. w.... ....8¼ to 11½. ess 6 ....3. ....8¼. ....4 to 6.	PHYSICS:—1........1st Div. 9½, 2d Div. 11½. BIOLOGY:—1 less 6 w........10½. or SURVEYING:—1 less 6 w........8¼ to 11½. HISTORY:—6 w........3. GERMAN:—1........8¼. *Speeches*:—Elective........4 to 6.	HISTORY:—1 GERMAN:—1- SURVEYING: HIGHER AST MATH.:—1.... *Speeches*—El
........11½. ....8¼. ....9½. ....2 to 4. -2-5 ....10½. ....10½. ....4 to 6.	CHEMISTRY:—1........11½. GERMAN:—1........8¼. LATIN:—1 less 3 w........9½. DESC. ASTRONOMY:—2-5........10½. *Speeches*:—Elective........4 to 6.	SURVEYING: FIELD WORK ANAL. MECH GERMAN:—1 *Speeches*—El
LOG........9½. ....2 ....10½. —1 ....4. —1........3. ....4. ....2 to 4. ....2. ....8¼. ....8¼. ....10½.	LOGIC AND PSYCHOLOGY:—1........9½. Electives. *Latin and French*:—1-2........2. *German*:—1........10½. *English Literature*:—1-2........4. *Political Economy*:—1-2........3. *History*:—1........4. *Chemistry*:—1........2 to 4. *Astronomy*:—1........2. *Surveying*:—1........8¼ to 12½. *Zoölogy*:—1........8¼. *Botany*:—1........8¼. *Mineral. and Lithol.*:—1........10½.	CIVIL ENGIN MINERAL. AN GERMAN:—2- ENGINEERING
l.:—1........9½. ....10½. ....5. ....4. ....3. ....4. ....2 to 4. ....2. ....8¼. ....8¼. ....11½. ....2 to 4.	Electives. *Moral Phil. and History of Phil.*:—1........9½. *German*:—1........10½. *Italian or Spanish*:—2-5........5. *English Literature*:—1-2........4. *International Law*:—1-2........3. *History*:—1........4. *Chemistry*:—1........2 to 4. *Astronomy*:—1........2. *Zoölogy*:—1........8¼. *Botany*:—1........8¼. *Geology*:—1........11½. *Laboratory Physics*:—1........2 to 4.	CIVIL ENGIN MACHINERY GEOLOGY:— Electives. *Chem* *Engi* *Labo*

4. MATHEMATICS—*Arithmetic.* Fundamental Rules, Fractions, Common and Decimal, Denominate Numbers, Percentage, Proportion, Involution and Evolution.

Algebra.—Fundamental Rules, Fractions, Simple Equations, Elimination, Involution and Evolution, the Calculus of Radicals, Quadratic Equations, Ratio, Proportion, and the Progressions, and an elementary knowledge of Logarithms; *i. e.* through Olney's Complete School Algebra, or an equivalent in other authors.

Geometry.—Plane, Solid and Spherical Geometry, *i. e.*, the first two parts of Olney's Geometry, or an equivalent in other authors.

5. LATIN.—*Latin Grammar.*—Harkness's or Allen and Greenough's.

Prose Composition.—Harkness's Introduction to Latin Composition, from page 50 to page 166; or forty-four exercises in Arnold's Latin Prose Composition, or an equal amount in Allen and Greenough's Latin Prose.

Reading.—Four books of Cæsar's Commentaries; Six Select Orations of Cicero, and the whole of the Æneid; or the first six books of the Æneid and an amount either of prose or of poetry equivalent to the last six books.

In reading the last six books of the Æneid, the principal aim should be to acquire facility in translation, and increased knowledge of the Latin vocabulary. It is supposed that the student, already familiar with the style of Virgil, will be able to read this portion of the Æneid more easily and rapidly than an equal amount in any other text book.

The *Roman Pronunciation of Latin* has been adopted.[*]

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[*] ROMAN PRONUNCIATION OF LATIN.—The University has adopted the following system of pronunciation, based upon the investigations of Corssen, and other eminent philologists, and now employed in its essential features in the Universities and leading schools of England, and in Harvard, Cornell, and other institutions of this country; as being proved beyond question a close approximation to the Roman pronunciation in the time of Cicero.

VOWELS.

Long.	*Short.*
a as in father.	a as in amend, or in quaff, (not as in hat.)
e as in they,	e as in met,
i as in machine.	i as in pity.
o as in go.	o as in police, (not as in cot.)
u as oo in too.	u as in pull, (not as in but.)
y as i.	

C

6. **GREEK.**—*Grammar.*—Hadley's or Goodwin's; *the Etymology must be thoroughly mastered.*

Prose Composition.—Jones's Exercises with special reference to the writing of Greek with the accents, and to the general principles of syntax. Arnold's Exercises are taken as an equivalent.

Reading.—Three books of Xenophon's Anabasis. The so-called continental sound of the vowels and diphthongs, and pronunciation according to the written accent, are preferred. In preparation Boise's First Greek Lessons will be found valuable.

Two full years of daily recitation in Greek are essential to success.

II. LATIN AND SCIENTIFIC COURSE.

Candidates for this course will be examined in French and in all the studies required for the Classical Course, excepting what is above required in Grecian History, in paragraph 3, and what is included in paragraph 6, **GEERK**. A general knowledge of all the principles of French Grammar and of French construction is required, together with some experience in the reading of easy, descriptive French. The amount of reading should be the equivalent of 75 pages in Bôcher's Otto's French Reader. Candidates using Duffet's French Method may prepare themselves in the whole of that work (2 Parts, including all the French reading matter therein contained) and in the

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DIPHTHONGS.

In pronouncing the diphthongs the sound of both vowels is preserved.

ae as the word ay.
au as ow in power.
oe as oi in oil.
eu nearly like u in use.
u in ua, ue, &c., like w.
ei as in rein.

CONSONANTS.

c always as in can.
ch as k.
g always as in gun.
j always as y in young.
s always as in sin.
t always as in tin.
v either as French ou in oui, or like Eng. v.

There is still considerable diversity of opinion among scholars as to the correct sound of v, and though the sonnd of ou in the French oui, or practically the sound of our w, is given to this consonant here, the sound of English v may be given, if preferred. The other consonants are sounded as in English.

The rules for syllabication are the same as in the old pronunciation, where two consonants come together; but a single consonant between two vowels is to be joined in pronunciation with the latter.

equivalent of 35 pages of Bôcher's Reader. Those using Fasquelle's or Otto's French Course may learn with profit the French verbs from Hennequin's Treatise on the French Verbs, and are recommended so to do.

Any students who are unable to procure satisfactory preparatory instruction in French may present an equivalent in German, and after admission to the University, make up their French by the aid of outside instruction.

III. GREEK AND SCIENTIFIC COURSE.

Candidates for this course will be examined in all the studies required for the Classical Course (excepting what is above included in paragraph 5, LATIN), and in French. The requirements in French are the same as for admission to the Latin and Scientific Course.

IV. SCIENTIFIC, ENGINEERING AND ARCHITECTURAL COURSES.

Candidates for these courses will be examined in the following studies:

1. ENGLISH LANGUAGE AND GEOGRAPHY.—In both, same as in Classical Course.

2. HISTORY.—Swinton's, or Freeman's, or Anderson's Manual of General History, or an equivalent.

3. MATHEMATICS.—Same as in Classical Course.

4. FRENCH.—Same requirement as the present for admission to the Latin and Scientific Course.

5. NATURAL PHILOSOPHY.—Cooley's "Text Book of Natural Philosophy," or Rolfe and Gillet's "Hand-book of Natural Philosophy," or an equivalent.

6. BOTANY.—The elements of Vegetable Anatomy and Physiology, as given in the first 27 chapters of "Gray's Lessons, or the First and Second Parts of Wood's "Class Book of Botany."

In 1879 and thereafter candidates for the Scientific Course will be required to analyze and present written descriptions of 50 species of Phanerogams.

7. ZOÖLOGY.—The First Part of "Orton's Comparative Zoölogy," or its equivalent.

8. ENGLISH LITERATURE.—Shaw's Manual of English Literature (Backus's Edition), or Stopford Brooke's English Literature.

9. GEOMETRICAL DRAWING.—The principles of Geometrical Drawing, Tinting and Shading, as contained in Warren's "Drafting Instruments," and drawings of all the figures of the Third Division of the Book, and those on Plates II., III., and IV., or an equivalent. The drawings must be neatly executed with India Ink, on Whatman's drawing paper, or on Bristol board. The "Medium" size drawing paper is recommended, and each sheet should be divided into four plates of equal size. After the work is completed, all the plates should be trimmed to a uniform size of about *eight* inches wide by *ten* inches long. It is advisable to secure only a small number of drawing instruments, but those should be of good quality, that they may answer for class exercises in the University. If more instruments are needed they can be procured here. German silver instruments are best.

Instruments and materials required:—One pair of plain dividers; one pair of dividers with pen and pencil point; one right line pen; a scale; a pair of triangles; a hard pencil and a piece of India ink. These articles, of good quality, need not cost over $4.00.

V. SELECTED STUDIES.

Those who do not desire to become candidates for a Degree may be admitted to any class for such time as they may choose, in case they pass the examinations necessary for admission to the Freshman class, and also exhibit such proficiency as will enable them to proceed advantageously in the particular studies which they propose to pursue. With such students an equivalent of German will be accepted in lieu of the French required for admission to certain courses.

Advanced scientific students who desire to pursue certain subjects as specialities, such as Chemistry, Geology, Astronomy, etc., may have the privilege of doing so, with consent of the professor in charge of such studies.

VI. ADVANCED STANDING.

Candidates for advanced standing will be examined in the previous studies for the course they propose to enter, and, if they come from another institution, will present certificates of honorable dismission.

VII. THE EXAMINATION FOR ADMISSION.

An examination for admission to the Department of Literature, Science and the Arts, will take place on Saturday and Monday, June 22d and 24th, 1878, and another, beginning on Thursday, September 19th, and continuing through the Friday and Saturday, and Monday following. These examinations will begin at 9 o'clock A. M., of each day.

The candidate must be provided with credentials from his last instructor, or from the last institution with which he has been connected. These must be presented to the President at his office, before the candidate can enter upon the examination.*

SPECIAL NOTICE TO PREPARATORY SCHOOLS.

A committee of the Faculty will visit once every year any Public High School in Michigan, on request of its School Board, and report its condition to the Faculty.

If the Faculty shall be satisfied from such report that the school is taught by competent instructors, and is furnishing a good preparation for any one or more of our regular courses, then the graduates from *such preparatory course or courses* will be ad mitted to the Freshman class of the University without examination, and permitted to enter on such undergraduate course or courses as the approved preparatory work contemplated.

They must present to the President, within three months after their graduation, the diplomas of their School Board, certifying that they they have sustained their examinations in *all* the studies prescribed for admission to one of the three courses, Classical, Scientific and Engineering, or Latin and Scientific. They will also be required to appear at once in their classes, otherwise they can be admitted only after examination.

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* Requests for specimen copies of examination papers are often sent to us. As our examinations for admission are chiefly oral, it is not practicable to comply with these requests.

The privilege of admission on diploma is limited to public schools in Michigan, and their School Boards must make the application annually.*

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*At the beginning of the University year 1877-8 students were received on diploma from the following schools: Ann Arbor, Battle Creek, Coldwater, Detroit, Fenton, Flint Grand Rapids, Jackson, Pontiac, and the State Normal School.

COURSES DESCRIBED.

It will be observed by reference to the Synchronistic Table (opposite page 32) that in the Classical, Scientific, and Latin Scientific Courses, an opportunity is offered in the Senior Year for large liberty in the choice of studies.

I. ENGLISH LANGUAGE AND LITERATURE.

This topic includes four branches of work; first, the study of the origin, growth and laws of our language; second, the study of the art of effective expression, whether by pen or voice; third, the study of the literature of our language; fourth, regular practice in writing and speaking.

Freshmen.—English Language—Lectures; Bain's Higher English Grammar; Gilmore's Art of Expression; Earle's Philology of the English Tongue; Tragedy of Julius Cæsar, with Abbott's Shakespearian Grammar. Lectures on Elocution, with exercises for the voice, and the delivery by each student of two original speeches.

Engineers.—In addition to work referred to in the previous paragraph, Rhetoric—Lectures; Hill's Rhetoric.

Sophomores.—English Literature—Lectures; Henry Morley's First Sketch of English Literature. Rhetoric—Lectures; Hill's Rhetoric. Exercises in English Composition once each week, with special criticism on each essay in the presence of the appropriate subsection.

Juniors.—English Exercises—*Elective*—Practice in debate, written and extemporaneous, as well as in criticism of argument and in the decision of argued questions. The exercises of each student are carefully criticised by the instructor in charge.

Seniors.—*Elective*—English Literature since the 15th Century—Direct study (results presented in written theses and in oral discussions) of More's Utopia; Spencer's Faëry Queen, Book I.; Bacon's Essays; Shakespeare's Sonnets; Milton's Paradise Lost, and Areopagitica; Pope's Dunciad; Burke's Reflections on the French Revolution: Wordsworth's Excursion; De Quincey's Confessions of an English Opium Eater.

The Shakespeare Course.—Study of Richard II.; both Parts of Henry IV.; Richard III.; Merry Wives of Windsor; Twelfth Night; As You Like It; Merchant of Venice; A Midsummer Night's Dream; Lear; Hamlet; Othello; Macbeth; Romeo and Juliet.

American Literature—Lectures once each week throughout the first Semester.

II. LATIN LANGUAGE AND LITERATURE.

Freshmen.—Cicero de Amicitia or Quintus Curtius; Latin Grammar; Selections from Livy; Latin Prose Composition; Roman History.

Sophomores.—Quintilian; Horace; Juvenal, Terence or Plautus; Prosody; Lectures on Roman Antiquities.

Juniors.—Tacitus; Lectures on Roman Literature.

Seniors.—The First Book of Cicero's Tusculan Disputations; Books 34th and 35th of Pliny's Natural History; Letters of the Younger Pliny; Lectures on Roman History, Art and Antiquities.

Teacher's Diploma.—Candidates for the Teacher's Diploma in Latin will be examined in Latin Prose Composition, Latin Grammar, Virgil, or some other text assigned by the Committee of Examination.

Post-Graduates.—Seneca's Prose Works; Lactantius.

III. GREEK LANGUAGE AND LITERATURE.

Freshmen.—*First Semester.*—Select Orations of Lysias; Greek Grammar; Greek History. *Second Semester.*—Homer's Odyssey, 5 books. Essays on Epic Poetry and the Homeric Age; History of Greek Literature.

Sophomores.—*First Semester.*—Selections from Thucydides. *Second Semester.*—The Antigone of Sophocles; the Prometheus of Æschylus; Analysis of Greek Tragedies; Lectures on the Greek Drama; Theocritus.

Juniors.—Demosthenes on the Crown; Lectures on the Greek Orators; Plato's Apology.

Seniors.—*First Semester.*—Selections from the Lyric Anthology; Lectures on the Lyric Poets; The Medea of Euripides; the Agamemnon of Æschylus; Lectures on the Greek Tragedy.

Teachers' Class.—Lectures on Greek Grammar.

Second Semester.—Lectures on The Clouds of Aristophanes; on the Greek Comedy; The Phædo or the Gorgias of Plato; Lectures on Greek Antiquities.

Teachers' Class.—Exercises in Greek Prose Composition.

Post-Graduates.—History of Classical Philology. The Greek Dialects.

The student will have opportunity to read with the instructor whatever author he pleases.

IV. MODERN LANGUAGES AND LITERATURE.

I. GERMAN.

IN THE CLASSICAL COURSE.

Seniors.—Whitney's Text-books, Gœthe's Egmont.

IN THE LATIN AND SCIENTIFIC COURSES.

Juniors.—Whitney's Text-books, Lessing's Minna von Barnhelm.

Seniors.—Gœthe's Iphigenie; E. Behn's Charles Dickens; Gœthe's Faust; Early English History (for translation into German); Lectures.

IN THE ENGINEERING COURSES.

Sophomores.—(Mining Engineers,) and Juniors (Civil Engineers), Whitney's Text-books.

II. FRENCH.

IN THE CLASSICAL COURSE.

Juniors.—Brachet's French Grammar (London edition); Racine's Athalie.

Seniors.—J. Milsand's L'Esthétique française; Étude sur John Ruskin.

IN THE LATIN SCIENTIFIC COURSE.

Freshmen.—Chardenal's French Exercises; Delavigne, Les Enfants d'Edouard; Further Translation from and into French; (Kenney's Raising the Wind, etc.); French Composition.

Sophomores.—Brachet's Nouvelle Grammaire française; Corneille's Polyeucte; Molière's Le Bourgeois Gentilhomme; Shakespeare's Julius Cæsar, with notes for translation into French; Lectures.

IN ALL OTHER COURSES.

Freshmen.—Chardenal; George Sand's Molière; Figuier's Les grandes inventions; French Composition, and translations of English into French.

Sophomores.—The same, for the most part, as in the Latin-Scientific course.

III. ITALIAN AND SPANISH.

Thirty Lessons in Italian or Spanish are offered to Seniors and Juniors in the second semester.

V. HISTORY.

I. REQUIRED HISTORY.

IN THE CLASSICAL COURSE.

Freshmen.—Grecian and Roman History; the authors most used are Smith and Merivale.

Sophomores.--Grecian and Roman History Completed. During the first two years of the course, an effort is made to give the student by means of lectures as well as text-books, as clear an insight as possible into the political life and institutions of Greece and Rome, from their foundation to their decline.

Juniors.—History of Civilization in Europe; Guizot being used as a text-book. Six lectures are given on Historians and Historical books.

IN THE SCIENTIFIC COURSE.

Sophomores.—Mediæval and Modern History. Lectures.

Juniors.—Civilization in Europe, Guizot.

IN THE LATIN AND SCIENTIFIC COURSE.

The same as the History in the Classical Course.

IN THE ENGINEERING COURSES.

Juniors.—Modern History, the same as that taken in the Scientific Course.

II. ELECTIVE HISTORY.

Members of the Classical Course and members of the Latin and Scientific Course, who desire further instruction in History have an opportunity of electing that study instead of Calculus during the second semester of the Sophomore year. To the students electing this course, daily lectures are given on the period extending from the Revival of Learning to the close of the Thirty Years' War. There is further opportunity of electing History as a full study during the whole of the Senior year. Those electing this Senior course are grouped in sections of twelve or fourteen students each, for the purpose of historical investigation. At the first meeting of the Class in each semester, a series of historical questions are assigned with numerous references to historical authorities. Each of the questions occupies the attention of each section of the Class for one week. Every student is required to read before the Class, in the course of the semester, one Thesis and one Critique, the Thesis being on one of the historical questions, and the Critique being on a thesis presented by one of the other members of the Class. Every student is further required to investigate each week the question for that week, and to come to the Class prepared to give the results of his investigation.

The questions considered during the first semester, are on the Constitutional History of England; those during the second are on the Constitutional History of the United States. To the students electing History during the Senior year, three courses of lectures are also given; one on the Government of Great Britain; one on the Governments of the larger Nationalities of Continental Europe; and one on the Political History of the United States. Two lectures are given each week during the whole of the Senior year.

VI. PURE MATHEMATICS.

IN THE CLASSICAL COURSE.

FRESHMEN.—*Geometry.*—Exercises in Geometrical invention, including theorems and problems, application of Algebra to Geometry, Loci, Maxima and Minimi, Transversals, and an elementary knowledge of the Modern Geometry, (*i. e.*, PART III. of Olney's Geometry,) and Plane Trigonometry. *Algebra.*—Theory of Indeterminate Coefficients, Binomial Theorem, and its application to the Development of Functions, Theory and use of Logarithms, Indeterminate Analysis, the Elements of the Theory of Equations, Sturm's Theorem, and Horner's Method of Solving Higher Equations; *i. e.*, PART III., of Olney's Algebra, or an equivalent in other authors.

SOPHOMORES.—*Trigonometry.*—Spherical. *General Geometry.*—Construction of Equations; Production of Equations of Plane Loci, Transformation of Coördinates and Properties of the Conic Sections. ELECTIVES. *Calculus.*—Differential, including differentiation of Functions of a Single Variable, McLaurin's and Taylor's Theorems, with Binomial Theorems and Theory of Logarithms deduced, Maxima and Minima, Functions of a Single Variable, Radius of Curvature, and the Elementary Principles of Tracing Curves; Integral, Elementary Forms, Binomial Differential, Rectification and Quadrature of Plane Curves and Volumes of Solids of Revolutions.

IN THE LATIN AND SCIENTIFIC COURSE.

Same as in Classical Course.

IN THE SCIENTIFIC COURSE.

FRESHMEN.—*Geometry.*—The same as Classical; *Plane and Spherical Trigonometry. Algebra.*—Same as Classical.

SOPHOMORES.—*General Geometry and Calculus.*—Same as in Classical including Elective.

IN THE CIVIL ENGINEERING COURSE.

Freshmen.—Same as Scientific.

Sophomores.—Same as Scientific to the middle of the Sophomore year, and the General Geometry and Calculus extended through this year.

Juniors.—*General Geometry.*—Polar Coördinates, Lines. Planes and Surfaces in space, including Surfaces of the Second Order. *Calculus.*—Differential, including Functions of Several Variables, with a fuller view of the Theory of Curves; Integral, extended so as to include Functions of two Variables and Special Processes of integrating.

IN THE MINING ENGINEERING COURSE.

Same topics as in Civil Engineering Course, pursued in the order indicated in the general table.

VII. PHYSICS.

The study of Experimental Mechanics, Acoustics and Optics, is pursued during the first semester of the Junior year.

In the second semester the study of Analytical Mechanics (with application of the Calculus), is required of the students in Civil and Mining Engineering, and is elective with German, and for the students in the Scientific Course is elective with a course of Laboratory work in Physics.

The subjects of Heat, Electricity and Magnetism are included in the instruction given by the Professor of Chemistry.

Provision has been made for giving the students in the Classical and Latin Scientific Courses, who desire to pursue as an extra study a course of Laboratory work in Physics, an opportunity for exercises in physical experimentation, and for becoming practically acquainted with the instruments and methods of physical investigation. For fuller details of this Laboratory work, see "Polytechnic School."

VIII. ASTRONOMY.

Besides the instruction mentioned in the Table, there is a course in Higher Astronomy, which embraces two years, and is optional. It begins with the first semester of the senior year; and the students who wish to go through the whole course must stay one year after graduation. The lectures during the two years embrace:

1. Spherical Astronomy, and the Theory of the Instruments.
2. Calculation of the Orbits of the Celestial Bodies.
3. Numerical Calculus; Theory of Interpolation; Method of the least Squares.
4. Physical Astronomy; Calculation of the Special and General Perturbations of Planets, and Perturbations of Comets.

During the whole time the student has ample opportunity to use the instruments of the Observatory, and to make astronomical calculations.

IX. GEOLOGY AND MINERALOGY.

The elements of *Mineralogy* and *Lithology* are imparted in the first semester, by means of lectures, recitations and practical studies in the class-room; Text-book, "Dana's Text-book of Mineralogy."

In the second semester the elements of Structural and Historical Geology are presented in a similar manner. Text-books, Dana's Manual and Le Conte's Elements of Geology.

For higher courses in these studies see "The Polytechnic School."

X. ZOÖLOGY.

IN THE SCIENTIFIC COURSE.

SOPHOMORES.—A course in Systematic Zoölogy, extending through the first semester. "Nicholson's Manual of Zoölogy will be used as a text book.

JUNIORS.—Three-fifths of the second semester will be occupied in the study of Comparative Anatomy, with Huxley's "Comparative Anatomy of Invertebrates," as a text-book. Use will be made of the Microscopical Laboratory in this study.

LATIN SCIENTIFIC COURSE.

SOPHOMORES.—Zoölogy alternating with Latin, during the first semester. Orton's Comparative Zoölogy will be used as a text-book.

For Senior Electives and special courses in Zoölogy, see "The Polytechnic School."

XI. BOTANY.

The study of Botany is pursued by the Scientific Freshmen during the whole of the second semester. Practical work with the microscope is required three days each week, with two days of recitation. Text-book, Thomé's "Structural and Physiological Botany."

An elective course may be taken by the members of the Scientific and Latin and Scientific sections of the Junior class. This course continues through three-fifths of the first semester. As many typical forms as can be considered in the time allotted are studied with special reference to their minute anatomy, and the history of their development. The students are expected to present correct drawings of the objects examined. One series of these drawings made on a uniform plan is deposited in the Microscopical Laboratory. The plan of instruction is essentially that indicated in Huxley's "Biology."

Both of these courses require work on the part of the student in the Microscopical Laboratory, for details concerning which, see "The Polytechnic School."

For special courses in Botany, see the "Polytechnic School."

XII. LOGIC AND INTELLECTUAL AND MORAL PHILOSOPHY.

Philosophy is taught by text-books and lectures; during the first semester, Logic and Psychology; and during the second semester, Moral Philosophy and the History of Philosophy, and the Evidences of Christianity.

XIII. POLITICAL ECONOMY AND INTERNATIONAL LAW.

The President gives instruction to Seniors during the first semester in Political Economy, and during the second semester in International Law.

XIV. ANATOMY, PHYSIOLOGY AND HYGIENE.

A course of lectures in Anatomy, Physiology and Hygiene, is sometimes given to the Junior Class by the Professor of Anatomy and Physiology.

XV. CHEMISTRY AND CHEMICAL MINERALOGY.

The instruction in Chemistry is embraced in a course of lectures to the Medical Class during the first semester, and to the Junior Class during the second, on Elementary Chemistry. The Institution being well supplied with apparatus, these lectures are fully illustrated by experiments, and attended by thorough reviews and examinations. On the basis of chemical classification of minerals, the science of minerals will be treated in connection with that of Chemistry.

Students most advanced in the science will be admitted into the Analytical Laboratory, and furnished with all the necessary material and apparatus, and will conduct, with their own hands, under the direction and supervision of the Professor, a systematic course of Qualitative Analysis. The object of this course will be two-fold: *First*, to make the student familiar, by actual practice, with the principles and laws of science, as well as the properties of the various elements and compounds, and their relation to each other; *Second*, to exercise the student in chemical manipulations, and to enable him to perform analytical investigations.

After a satisfactory completion of Qualitative Analysis, the student may enter upon any of the following courses:

Quantitative Analysis,
Assaying—for Metals,
Toxicological Examinations,
Chemical Mineralogy,
Volumetric Analysis,
Pharmaceutical Preparations,
Ultimate Organic Analysis.

Those who are competent may receive aid in Original Investigations. (See Mining Engineering and Pharmacy under "The Polytechnic School.")

TEXT-BOOKS AND WORKS OF REFERENCE.

Miller's Chemistry,
Bloxam's Chemistry,
Douglas and Prescott's Analysis,
Plattner on the Blow-Pipe,
Brush's Manual of Blow-Pipe Analysis,
Storer's Solubilities,
Fresenius's and Rose's Analysis,
Sutton's Volumetric Analysis,
Dana's Mineralogy,
Watt's Dictionary of Chemistry,
Cavendish's Publications.
Knapp's Chemical Technology.

XVI. ENGINEERING.

Instruction in the several subjects pertaining to Civil and Mining Engineering is given by the use of text-books, lectures, reading in the general library, and daily recitations or exercises. The University possesses a good collection of Surveying and Engineering instruments, and ample opportunity is afforded the student to become familiar with their use. For full details of these courses see "The Polytechnic School."

XVII. DESCRIPTIVE GEOMETRY AND DRAWING.

Thorough instruction is given in Plane Projection Drawing, Isometric, Descriptive Geometry, and its applications to Carpentry and Stone-Cutting, Shades and Shadows, Linear Perspective, Topographical, Free Hand and Machine Drawing. This Course can also be seen by referring to the "Polytechnic School."

TEACHERS' DIPLOMAS.

Any member of the Senior class who pursues courses of study with reference to preparation for teaching, and who by special examinations shows such marked proficiency as qualifies him to give instruction, may receive a special Diploma signed by the President and by the Professors who have charge of the studies he has taken with this object in view.

A special examination in the ancient and modern languages and mathematics for the Teacher's Diploma, will be held the week before the spring vacation. This Diploma is designed to be the certificate of qualification for teaching, and is the only form of recommendation which will be given by the Professors in charge of these studies.

STUDIES, ATTENDANCE AND DISCIPLINE.

No student is expected to pursue more or less than three studies at one time, without special permission of the Faculty.

No student can drop any course or study until he shall have attended the regular examinations of the same.

In order to rank in the Calendar in any particular class, a student must, at the time of the publication of the Calendar, have completed (leaving no deficiencies or conditions) the work of that class up to the beginning of the current academic year. Otherwise his name will appear in the roll of the class next below. The rules of the University require that every student shall be in his place at all stated exercises, from the beginning to the close of his connection with the University.

Such delinquencies as tardiness, absence, deficiencies, offenses against good order, in the several departments of instruction, are ordinarily dealt with by the Professor in charge of the department in which they occur. Flagrant cases are reported to the Faculty for adjudication.

Students who are not in their places at the opening of the semester must present written excuses from their parents or guardians for the delay.

Students are not allowed to absent themselves from town without permission from the President.

The State of Michigan extends the privileges of the University, without charge for tuition, to all persons of either sex, who are qualified for admission. Thus it does not receive patronage, but is itself the patron of those who seek its privileges and its honors. It cannot, however, be the patron of idleness or dissipation. Its crowded classes have no room except for such as assiduously pursue the studies of their choice, and are willing to be governed in their conduct by the rules of propriety.

Students are suspended or dismissed, whenever, in the opinion of the Faculty, they are pursuing a course of conduct seriously detrimental to themselves or the University.

The following are extracts from the by-laws of the Regents.

"Concerted absence from any appointed duty by a class or any number of students together, will be regarded as a great violation of good order, and will be followed by suspension or dismission, at the diseretion of the Faculty."

"Whenever any Faculty is satisfied that a student is not fulfilling, or likely to fulfill, the purpose of his residence at the University, or is for any cause an unfit member thereof, the President shall notify his parents or guardians, that they may have an opportunity to withdraw him, and if not withdrawn within a reasonable time, he shall be dismissed."

THE FACULTY

OF THE DEPARTMENT OF

Literature, Science, and The Arts.

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Rev. GEORGE P. WILLIAMS, LL. D.,
CORYDON L. FORD, M. A., M. D.,
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VICTOR C. VAUGHAN, Ph. D.,
HENRY B. PARSONS, Ph. C.,
LOUISA M. REED, M. S.

STUDENTS.

RESIDENT GRADUATES.

NAME.		RESIDENCE.
Fred Leroy Bliss, B. A.,	*University of Michigan*,	Jackson.
Branch H. Colby, B. S.,	*University of Michigan*,	Ann Arbor.
Clara M. Colman, B. A.,	*University of Michigan*,	Ann Arbor.
Mary Emma Farrand, PH. B.,	*University of Michigan*,	Port Huron.
Abram Sager Hall, PH. B.,	*University of Michigan*,	Ann Arbor.
Arthur Gordon Oven, B. A.,	*University of Michigan*,	Macon.
Robert Hall Tripp, M. A.,	*University of Michigan*,	Ann Arbor.

SENIORS.

NAME.	COURSE.	RESIDENCE.
Daniel Ayres Allen,	L.	*Ann Arbor.*
Marion Benjamin Allen,	L.	*Geneva.*
George Franklin Allmendinger,	Eng.	*Ann Arbor.*
Alexis Caswell Angell,	Cl.	*Ann Arbor.*
Clarence Oliver Arey,	Eng.	*Whitewater, Wis.*
Walter Wheaton Augur,	Cl.	*New Orleans, La.*
Florus Alonzo Barbour,	Cl.	*Pontiac.*
Minnie Bary,	Cl.	*Detroit.*
Charles Emerson Beecher,	Sc.	*Warren, Pa.*
Cora Agnes Benneson,	Cl.	*Quincy, Ill.*
William Henry Butts,	Cl.	*Ann Arbor.*
Mary Elizabeth Byrd,	Cl.	*Lawrence, Kansas.*
Eva Chandler,	Cl.	*Pontiac.*
J. Rose Colby,	L.	*Ann Arbor.*

NOTE.—By our rule in order to rank in any particular Class, a student must have completed (leaving no deficiencies or condition) the work of that Class up to the beginning of the current academic year. Therefore the names of some students appear in the Class below that with which they will probably graduate.

We print the names of those students only who have been in actual attendance during the year.

ABBREVIATIONS.—*Cl.*—Classical Course. *L.*—Latin and Scientific Course. *Sc.*—Scientific Course. *Eng.*—Civil Engineering. *M. Eng.*—Mining Engineering.

NAME.	COURSE.	RESIDENCE.
Webster Cook,	Cl.	*York.*
Charles Malcolm Cooley,	L.	*Decorah, Iowa.*
Michael Buchanan Danaher,	Cl.	*Ludington.*
Charles M. Daugherty,	Cl.	*Xenia, O.*
David Noble De Tarr,	Cl.	*Boone, Iowa.*
James Dick Du Shane,	Eng.	*Connellsville, Pa.*
John Herbert Edwards,	L.	*Dixon, Ill.*
Randall P. W. Fleming,	Cl.	*Mason.*
Charles Edwin Garner,	L.	*Ann Arbor.*
Franklin Garrison,	Cl.	*West Nassau, N. Y.*
Charles Mills Gayley,	Cl.	*Ann Arbor.*
Clarence Griggs,	Cl.	*Ottawa, Ill.*
William V. Grove,	Eng.	*Williamsville, N. Y.*
John K. Hanson,	Eng.	*Ann Arbor.*
Paul Henry Hanus,	Sc.	*Mineral Point, Wis.*
George Hatfield Harrower,	Cl.	*Albany, N. Y.*
Watson Dexter Hinckley,	L.	*Fredonia, N. Y.*
George Horton,	Cl.	*Ann Arbor.*
Edward King Hubbard,	Cl.	*Detroit.*
William Lee Jenks,	Cl.	*St. Clair.*
John Butler Johnson,	Eng.	*Kokomo, Ind.*
William Claflin Johnson.	L.	*Detroit.*
Timothy Josenhans,	Eng.	*York.*
Henry Wick Judd,	M. Eng.	*Flint.*
George Wells Knight,	Cl.	*Ann Arbor.*
Eugene George Mann,	M. Eng.	*Ann Arbor.*
William V. Moore,	Cl.	*Detroit.*
Seymour Tenny Morse,	Eng.	*Highland.*
Horace Greeley Myers,	Sc.	*Varna, Ill.*
Harry Pierce Myrick.	Cl.	*Ann Arbor.*
Albert James Norton,	L.	*Coldwater.*
Charles Fernando Owen,	Eng.	*Dearborn.*
Annie Smith Peck,	Cl.	*Providence, R. I.*
Charles Kendall Perrine,	Cl.	*Jackson.*
James Hervey Raymond,	Cl.	*Austin, Texas.*
Jay Junius Reed,	Sc.	*Blackberry, Ill.*
Albert William Ryan,	Cl.	*Mt. Clemens.*
James Sanderson,	Eng.	*Detroit.*
Orr Schurtz,	Cl.	*Constantine.*
James Truman Shaw,	Cl.	*Detroit.*
Ossian Cole Simonds,	Eng.	*Grand Rapids.*
Frank Leonard Sizer,	Eng.	*Ottawa, Ill.*

NAME.	COURSE.	RESIDENCE.
Hiram Everett Terry,	Eng.	*Avon.*
Cora Ilione Townsend,	Cl.	*Ann Arbor.*
Stuart Douglas Walling,	Cl.	*Circleville, O.*
Horace Bailey Wamsley,	Cl.	*Huntertown, Ind.*
Louis K. Webb,	Sc.	*Kalamazoo.*
Andrew Whitehead,	Cl.	*Coldwater.*
Sydney Buckminster Wight,	M. Eng.	*Detroit.*
Ross Wilkins,	L.	*Detroit.*
Theo. John Wrampelmeier,	Cl.	*Louisville, Ky.*

JUNIORS.

NAME.	COURSE.	RESIDENCE.
Walter Scott Abell,	M. Eng.	*San Francisco, Cal.*
Edward Playfair Anderson,	Cl.	*Ottawa, Kan.*
Erastus Albert Barnes,	Cl.	*Owosso.*
Joseph Allen Beaumont,	Eng.	*Peru, Ind.*
Fred Somers Bell,	L.	*Fort Dodge, Iowa.*
John Harris Black,	L.	*Chicago, Ill.*
Mary Lavina Blood,	Cl.	*Waltham, Mass.*
James Padelford Brown,	L.	*Milwaukee, Wis.*
Hubert William Brown,	Cl.	*Ann Arbor.*
William Foster Bryan,	Cl.	*Lafayette, Ind.*
Edmund Adolph Christian,	Cl.	*Wyandotte.*
Frantz Hunt Coe,	Cl.	*Ann Arbor.*
Richard Gay De Puy,	Cl.	*Ann Arbor.*
Fannie Clinton Farrand,	Cl.	*Ann Arbor.*
Marion Sarah Gerls,	L.	*Pontiac.*
Isaac Channing Goff,	Eng.	*Cleveland, O.*
Thomas C. Greene,	L.	*Troy, N. Y.*
Leroy Halsey,	Cl.	*Chicago, Ill.*
Frank Dwight Haskell,	Cl.	*Ann Arbor.*
Charles Sumner Henning,	Eng.	*Plano, Ill.*
Cicero Demerit Hill,	Eng.	*Milwaukee, Wis.*
Edwin Walter Jenney,	Cl.	*Chicago, Ill.*
Fred Parker Jordan,	Cl.	*Battle Creek.*
Brayton Daniel King,	Eng.	*Ann Arbor.*
Lorenzo John Locy,	Sc.	*Flint.*
Newton McMillan,	Cl.	*Ann Arbor.*
Frank Day Mead,	Cl.	*Ann Arbor.*
Jesse Fonda Millspaugh,	Cl.	*Battle Creek.*
H. Throop Morley,	M. Eng.	*Marine City.*

NAME.	COURSE.	RESIDENCE.
Thomas Henry Noble,	M. Eng.	*Elk Rapids.*
Mark Norris,	L.	*Grand Rapids.*
James Elijah Pilcher,	Cl.	*Detroit.*
Irving K. Pond,	Eng.	*Ann Arbor.*
Henry Camp Post,	M. Eng,	*Grand Rapids.*
John Charles Quintus,	M. Eng.	*Grand Rapids.*
John Ross Russell,	Cl.	*Detroit.*
Spencer Ramsey Smith,	Cl.	*Fort Wayne, Ind.*
Kenneth Russell Smoot,	Cl.	*Ann Arbor.*
Douglas Houghton Stringham,	Cl.	*Ann Arbor.*
Sarah Elizabeth Swift,	Cl.	*Wayne.*
John Hubbard Tweedy, Jr.,	Cl.	*Milwaukee, Wis.*
Evert Van Pelt,	Eng.	*Buffalo, N. Y.*
Charles Gilbert Van Wert,	L.	*Norvell.*
Elmer Randolph Webster,	Cl.	*White Lake.*
Andrew Wenzell,	Eng.	*Detroit.*
Enoch Clark White,	Cl.	*Lapeer.*
George Spencer Willits,	Cl.	*Monroe.*
E. Fred. Wood,	M. Eng.	*Ann Arbor.*
George Deming Wright,	Cl.	*Fenton.*

SOPHOMORES.

NAME.	COURSE.	RESIDENCE.
John Jacob Abel,	L.	*Cleveland, O.*
Frank Gates Allen,	Cl.	*Aurora, Ill.*
Josiah Little Ambrose,	L.	*Chicago, Ill.*
Henry Winfield Ashley,	Cl.	*Toledo, O.*
William Livingston Axford,	L.	*Holly.*
John Ayres,	Eng.	*Fort Smith, Ark.*
Archie W. Banks,	Sc.	*Ann Arbor.*
Henry Spalding Bangs,	Cl.	*Fenton.*
Orlando Fleming Barnes,	Cl.	*Lansing.*
Charles Augustus Barry,	L.	*Ann Arbor.*
Samuel Lloyd Beaumont,	M. Eng.	*Ann Arbor.*
Clarence Edwin Bement,	Cl.	*Lansing.*
John Marion Brewer,	Cl.	*Romeo.*
Thomas Bertrand Bronson,	Cl.	*Ann Arbor.*
Charles Carroll Brown,	Eng.	*Indianapolis, Ind.*
Arthur William Burnett,	Cl.	*Tecumseh.*
Carina B. Campbell,	Cl.	*Monroe.*
Charles Hotchkiss Campbell,	L.	*Detroit.*

NAME.	COURSE	RESIDENCE.
John Chase,	Cl.	*Ann Arbor.*
Chauncey Ferris Cook,	Cl.	*Hillsdale.*
J. C. Waterson Cowley,	Cl.	*Pontiac.*
Ismena Cramer,	L.	*Ann Arbor.*
Lewis Franklin Culver,	Cl.	*Quincy.*
Andrew Strong Deacon,	Eng.	*Harrisonville, Mo.*
Laura Donnan,	Cl.	*Indianapolis, Ind.*
John William Dorst,	Eng.	*New Albany, Ind.*
Frank Merrill Dunlap,	Eng.	*Detroit.*
Thomas Randolph Edwards,	L.	*Ann Arbor.*
John Thomas Ewing,	Cl.	*Ann Arbor.*
David Felmley,	Cl.	*Perry, Ill.*
Jay Fuller,	L.	*Buchanan.*
George Mahlon Gillette,	L.	*Niles.*
Mary Henrietta Graham,	L.	*Ann Arbor.*
Charles Howard Greathouse,	Cl.	*Uniontown, Ky.*
John Alexander Green,	Cl.	*Austin, Texas.*
William Albert Greeson,	Cl.	*Kokomo, Ind.*
Frederick James Gurney,	Cl.	*Chicago, Ill.*
Norman Washington Haire,	Cl.	*Leslie.*
William Helmle,	Cl.	*Springfield, Ill.*
George Hempel,	Cl.	*Ann Arbor.*
William Cary Hill,	Cl.	*Ann Arbor.*
William Henry Honey,	Cl.	*Ypsilanti.*
Ledru Rollin Hunter,	Cl.	*South Lyon.*
Frank Arthur Johnson,	Cl.	*Ann Arbor.*
William Kemper Jones,	Cl.	*Grand Rapids.*
Jessie Kennedy,	L.	*Eau Claire,*
James R. Laing,	Eng.	*Ann Arbor.*
Peter Burr Loomis, Jr.,	Cl.	*Jackson.*
Frank Wood Loveland,	M. Eng.	*Golden, Col.*
Milton Mozart Marble,	Cl.	*Ann Arbor.*
Charles King McGee,	Cl.	*Jackson.*
James Wilfred McKinley,	Eng.	*Newcastle, Pa.*
Charles Sumner Mitchell.	L.	*St. Cloud, Minn.*
Frederick Clemens Myrick,	L.	*Ann Arbor.*
Carrie Cook Parrish,	Cl.	*Ann Arbor.*
Cyrus Augustus Pomeroy,	Cl.	*Ann Arbor.*
Allen Bartlit Pond,	Cl.	*Ann Arbor.*
Frances Anna Prentiss,	Cl.	*Bay City.*
Frank Fremont Reed,	Cl.	*Ann Arbor.*
Harry Slade Richards,	L.	*Paw Paw.*

Name.	Course.	Residence.
Arthur Raymond Rood,	L.	*Lapeer.*
Frank Satterlee,	Eng.	*Birmingham.*
Frank P. Secor,	Cl.	*Racine, Wis.*
Osman C. Seelye,	Cl.	*Ann Arbor.*
Edwin Stanton Sherrill,	Cl.	*Detroit.*
J. Warren Smith,	Cl.	*Eaton Rapids.*
Jefferson Ray Thomas,	Sc.	*North Plains.*
Malcolm Parker Thomas,	Cl.	*Schoolcraft.*
Charles Wellington Tufts,	Cl.	*Leslie.*
Alice Van Hoosen,	Cl.	*Rochester.*
Lucius Lincoln Van Slyke,	Cl.	*Pike, N. Y.*
Byron Sylvester Waite,	Sc.	*Fenton.*
William Dow Washburn,	Cl.	*Platteville, Wis.*
Charles Chase Whitacre,	M. Eng.	*Chicago, Ill.*
John Haven Willard,	L.	*Chicago, Ill.*
Charles Moseman Wilson,	L.	*Ionia.*

FRESHMEN.

Name.	Course.	Residence.
Ralph Arthur Angell,	L.	*Wenona.*
Martha Elizabeth Arnold,	L.	*Detroit.*
Elizabeth Bangs,	Cl.	*Ottawa, Ill.*
Gustav Frederick Behr,	Sc.	*Ann Arbor.*
Charles Belmont,	Cl.	*Boston, Mass.*
Guy Maynard Bigelow,	Cl.	*Memphis, Tenn.*
Fremont Charles Blandin,	Cl.	*Rutland, Ill.*
George Webster Borden,	Cl.	*Ann Arbor.*
Frank Pardee Boughton,	Cl.	*Battle Creek.*
Willis Boughton,	Cl.	*Sheffield, Ill.*
Edward Harvey Bowman,	Cl.	*St. Charles, Ill.*
Frank Eldridge Bradley,	L.	*Bay City.*
Edward Miles Brown,	L.	*Schoolcraft.*
George Alfred Brown,	Eng.	*Indianapolis, Ind.*
Randolph Willis Brown,	Eng.	*Rochester, Minn.*
Susie L. Brown,	Sc.	*Milford.*
Claude Robinson Buchanan,	Cl.	*Grand Rapids.*
Isaac Howard Bullock,	L.	*Kelton, Pa.*
Samuel Chandler,	Cl.	*Ann Arbor.*
Robert P. Clark,	Sc.	*Chicago, Ill.*
Thomas Collier Clark,	L.	*Ann Arbor.*
Charles Henry Cole,	Cl.	*Ann Arbor.*

NAME.	COURSE.	RESIDENCE.
Festus Clark Cole,	L.	*Ann Arbor.*
Nellie May Colman,	Cl.	*Ann Arbor.*
Arthur B. Cook,	Cl.	*Flint.*
William Wilson Cook,	Cl.	*Hillsdale.*
Morris Levi Courtright,	L.	*Bay City.*
Rufus Crippin,	Cl.	*Three Rivers.*
Isaiah Reed Crossette,	Cl.	*Ypsilanti.*
Julia Melissa Crouch,	L.	*Erie, Pa.*
George Brown Daniels,	Cl.	*Grand Rapids.*
Eliza Darling,	L.	*La Porte, Ind.*
Francis Root Day,	Eng.	*Chicago, Ill.*
William Freeman Dodge,	Sc.	*Ionia.*
Benjamin Leonard D'Ooge,	Cl.	*Grand Rapids.*
Charles Levi Dubuar,	Cl.	*Northville.*
Dow Dunning,	Cl.	*Ann Arbor.*
James T. Eaglesfield,	Cl.	*Terre Haute, Ind.*
Jane Eyer,	Cl.	*Highland Park, Ill.*
Charles Henry Fisher,	Cl.	*Tecumseh.*
Allan Miller Fletcher,	L.	*Detroit.*
George Henry Fletcher,	Cl.	*Mankato, Minn.*
Frank Augustus Foster,	L.	*Ludington.*
Duane Edwin Fox,	Cl.	*Grand Rapids.*
Allan Howard Frazer,	L.	*Detroit.*
William Galpin,	Cl.	*Ann Arbor.*
Anna Bordwell Gelston,	L.	*Ann Arbor.*
Fred Harris Goff,	L.	*Cleveland, O.*
Charles Watson Goodrich,	Cl.	*Milwaukee, Wis.*
Schuyler Colfax Graves,	Cl.	*Grand Rapids.*
Nat Gunter,	L.	*Sherman, Texas.*
William Washington Hannan,	Cl.	*Dowagiac.*
John Evangelus Hathaway,	Eng.	*Milwaukee, Wis.*
Forman Spencer Hendrickson,	L.	*Ann Arbor.*
William Simon Hill,	Cl.	*Oxford.*
E. Harold Hilton,	Cl.	*Ann Arbor.*
John Flavel Hinman, Jr.,	Cl.	*Battle Creek.*
Charles Wellman Hitchcock,	Cl.	*Kalamazoo.*
Herbert Augustus Hodge,	M. Eng.	*Concord.*
David Emery Hoover,	Eng.	*Ionia.*
Maurice Meir Houseman,	L.	*Grand Rapids.*
Delia Estelle Howe,	Cl.	*Lansing.*
James Edmund Hunt,	Cl.	*Toledo, O.*
Ormond Fremont Hunt,	Cl.	*Ann Arbor.*

NAME.	COURSE.	RESIDENCE.
Wetmore Hunt,	L.	*Detroit.*
Charles Hutchinson,	L.	*Marshall.*
Alfred Miller Huycke,	Cl.	*Ann Arbor.*
Edward Israel,	Cl.	*Kalamazoo.*
Collins Hickey Johnston,	Cl.	*Detroit.*
James F. Jordan,	Cl.	*Decatur.*
John Kelley, Jr.,	Cl.	*Detroit.*
Homer Hitchcock Kingsley,	Cl.	*Kalamazoo.*
Charles Hannibal Kumler,	Cl.	*Dayton, O.*
George Anthony Lederle,	Eng.	*Detroit.*
W. Leigh Liggett,	Cl.	*Detroit.*
Charles Milton Lightner,	L.	*Detroit.*
William Albert Locy,	Cl.	*Flint.*
William Wesley Lowry,	Cl.	*Hackettstown, N. J.*
Frank Chittenden Mandell,	Cl.	*Detroit.*
Alice Mansfield,	Cl.	*Coldwater.*
Everett Marshall,	Eng.	*Cleveland, O.*
Adolph Burton Mason,	L.	*Grand Rapids.*
Percy Shelley McFarland,	Cl.	*Ann Arbor.*
David McKenzie,	Cl.	*Detroit.*
Frank McNamara,	L.	*Lapeer.*
Bion DeVaughn Meredith,	L.	*Van Wert, O.*
Alice Jane Merritt,	L.	*Wilson, N. Y.*
William Clayton Miller,	Eng.	*Marquette.*
Lydia Union Moore,	Cl.	*Ann Arbor.*
Margaret E. Morton,	Cl.	*Ann Arbor.*
Eugene C. Nardin,	L.	*Belle Branch.*
Sarah Maria Newton,	Sc.	*Flint.*
Theron Clarence North,	Eng.	*Lansing.*
Leroy Stephen Norton,	L.	*Shabbona, Ill.*
Anna Adair Ockford,	Cl.	*Ann Arbor.*
Horace Mann Oren,	Cl.	*Indianapolis, Ind.*
Isaac Newton Payne,	Cl.	*Port Clinton, O.*
Herbert Maury Pelham,	Sc.	*Plymouth.*
Moss Kent Perkins.	Cl.	*Ann Arbor.*
Richard Ralph Petitt,	Cl.	*Clymer, N. Y.*
Augustus V. R. Pond,	L.	*Quincy.*
Albert J. Potter,	Cl.	*Niles.*
Henry Sherring Pratt,	Cl.	*Toledo, O.*
Rowland Henry Rerick,	Sc.	*La Grange, Ind.*
Harry Chase Richardson,	Cl.	*Princeton, Ill.*
Frank Carle Robbins,	Cl.	*Niles, O.*

Name.	Course.	Residence.
George Willis Rood,	Cl.	*Lapeer.*
Louis Sax,	Cl.	*Milwaukee, Wis.*
Stewart Niblo Schermerhorn,	Cl.	*Grand Rapids.*
John Giles Schurtz,	Cl.	*White Pigeon.*
Job Hart Scott,	Cl.	*Brighton.*
Levi T. Shaw,	Cl.	*Brownsville.*
Clarence William Sessions,	L.	*Ionia.*
Jennie T. Sherzer,	L.	*Franklin, O.*
Nellie Abby Stanley,	Cl.	*Mishawaka, Ind.*
Edward Blair Stanton,	L.	*Ionia.*
T. J. Mumford Starring,	Eng.	*Detroit.*
Walter Louis Stebbings,	Cl.	*Englewood, Ill.*
Charles E. St. John,	Cl.	*Reading.*
Samuel Marston Stocker,	L.	*Muscatine, Iowa.*
William W. Stockley,	Cl.	*Calumet.*
Thomas Carlyle Tate,	Sc.	*Keokuk, Iowa.*
Harriet B. Taylor,	Cl.	*Almonte.*
Frank Taylor Terry,	Cl.	*Milwaukee, Wis.*
Charles Thad Thompson,	L.	*Detroit.*
William Mann Thompson,	Cl.	*Jackson.*
Charles Arnette Towne,	L.	*Spring Lake.*
Charles Elroy Townsend,	Sc.	*Concord.*
Fred Murraie Townsend,	Cl.	*Ann Arbor.*
Henry Holmes Treadway,	Cl.	*Pontiac.*
Joel Claverly Tyler,	Cl.	*Kalamazoo.*
Edward P. Van De Vanter,	Cl.	*Sturgis.*
Edward L. Webster,	Sc.	*Jackson.*
Jean Augustus Wetmore,	Sc.	*Concord.*
Samuel Edwin Wheat,	Cl.	*Leavenworth, Kan.*
Will Turner Whedon,	L.	*Ann Arbor.*
Asa Devillo Whipple,	Cl.	*Fowlerville.*
Edwin Kirby Whitehead,	Cl.	*Coldwater.*
Everett Jerome Whitehead,	Cl.	*Fenton.*
Ella C. Williams,	Cl.	*Watkins, N. Y.*
Samuel Lane Williams,	Cl.	*Lapeer.*
Charles Gaston Wilson,	L.	*Sturgis.*
Frederick Bissell Wood,	L.	*Tecumseh.*
Sheldon Alva Wood,	Cl.	*Fenton.*
Eva Woodward,	L.	*Rochester.*
Wilder Mack Wooster,	Cl.	*Decatur.*
Max Zinkeisen,	Cl.	*Milwaukee, Wis.*

STUDENTS IN SELECTED STUDIES.

NAME.	RESIDENCE.
F. Belle Bailey,	*Fulton, Mo.*
Richard Bayard Bancroft,	*Port Huron.*
James David Callahan,	*Mina, N. Y.*
Alice Elizabeth Clark,	*Ann Arbor.*
Ellen Lucy Clothier,	*Fredonia, N. Y.*
Roger William Cooley,	*Decorah, Iowa.*
Nancy Donovan,	*Ionia.*
Oren Dunham,	*Toledo, Ohio.*
Mary Alice Goodrich,	*Ann Arbor.*
Charlotte Lawrence Hall,	*Ann Arbor.*
Clara Belle Hawley,	*Mason.*
Thomas Lorenzo Heaton,	*Potsdam, N. Y.*
Ella Hutchins,	*Ionia.*
Jerry Whipple Jenks,	*Rock Falls.*
Thaddeus S. McCoy,	*Van Wert, Ohio.*
Ida Frances Noyes.	*Detroit.*
Albert Samuel Pettit,	*Ann Arbor.*
Charlotte M. Smith,	*Pontiac.*
G. Norwood Van Wormer,	*Bay City.*
James D. Wilson,	*Chicago, Ill.*
Lewis Cass Woodman,	*Northville.*

The Polytechnic School.

The University has for years given advanced instruction in the mathematical, physical and natural sciences, and thorough courses in the practical application of these sciences to the arts. We have now given to the different branches of such work a closer grouping, a more compact organization, and an ampler development, and have recognized by name what we have already had in fact, The Polytechnic School. It comprises the course in Civil Engineering, the School of Mines, Advanced Course in Science, and the School of Pharmacy.

The work is arranged with reference to the wants of two classes of students:

First, Those pursuing the study of Civil or Mining Engineering, or the study of Pharmacy (which includes an extended course in Analytical Chemistry) with the view of graduating.

Secondly, Graduates of colleges and other persons qualified for advaneed or special study of Mineralogy, Geology, Zoölogy, Botany, Civil or Mining Engineering, Physics, Analytical and Applied Chemistry, Pharmacy or Metallurgy.

In the Museum of Scientific Collections with its specimens. in the spacious and well-appointed Chemical, Microscopical, and Mineralogical Laboratories, in the Engineering Instruments and Models, in the Architectural Collection, and in the apparatus of the several departments of science, large facilities for illustrative teaching and study are furnished.

The general scope of the work and of the advantages offered for it is indicated in the descriptions which follow:

I. CIVIL ENGINEERING.

The University aims, by the course of study pursued in the department of Civil Engineering, to lay a foundation of sound theory, sufficiently broad and deep, to enable its graduates to enter understandingly on the further investigation of the several specialities of the profession, and, at the same time to impart such a knowledge of the usual practice of an office, and of an engineering field party, as shall make its students useful in any position to which they may be called. The adaptation of theory to practice can be thoroughly learned only by the training of actual experience; whatever experience can be gained in a college course, under the guidance of those who have had this training, the University encourages its students to acquire.

A successful completion of the full course is necessary to entitle a student to a degree in Civil Engineering; but select students, not candidates for a degree, may pursue any such studies (three in number) as they may prefer, provided they are found prepared to join the classes in those studies; and they will be expected to attend all the lectures, recitations and examinations with the regular students.

Graduates of the Classical, Scientific, and Latin Scientific courses, and of other colleges whose courses of study are equivalent to ours, are admitted to the degree of Civil Engineer after attendance on, and a satisfactory examination in, the technical subjects alone of this course as set forth in the schedule on the following pages, in addition to the Mathematics and Analytical Mechanics of the Junior year. These studies can be completed in two years.

Each candidate for graduation must also submit a Thesis upon some approved subject, accompanied by the proper drawings, and must be prepared to pass an examination on the same before he is recommended for a degree.

Every student in Surveying is afforded abundant opportunity of becoming familiar with the excellent assortment of instruments owned by the University, in number sufficient to equip well its classes, and embracing all of the usual assortments for actual work.

Field practice is a portion of the regular course. The classes in surveying are drilled in all that pertains to that branch of engineering; they make surveys, traverse them, calculate contents, divide up land, and solve problems in heights and distances from data taken by the members themselves. They also determine the meridian and take observations for latitude. This work is done during the fall months of the Junior year; during the winter the finished plans of the surveys are made.

The classes in railroad engineering have practice in running curves and levels, and in the measurement of earthwork. They are also, near the close of the Junior year, taken into the field as a railroad party, under competent and skilled supervision, for two or three weeks continuously, when they go through all the field work for a projected line; reconnoisance, preliminary and location surveys, cross-sectioning, staking out, contouring and topography, doing all the work up to the point of actual construction. An actual plan and profile carefully made by each student from the field notes of the party, completes this portion of the subject, and serves to fix the practical application of the principles obtained from the text-books and lectures.

A course of instruction is given in Analytical and Applied Mechanics, by both text-books and lectures, the work being shaped especially for the needs of engineering students.

The study of the Strength of Materials and the Theory of Construction covers a course of recitations and lectures for an entire year. Rankine's Manual of Civil Engineering is used during the greater portion of this time, with full explanations, examples and problems. The student is made familiar with both the analytical and graphical methods of treatment, as recently developed and applied, and thus possesses an advantageous proof of the accuracy of his calculations.

The instruction is illustrated also by models, drawings, photographs, lithographs, etc., including a fine collection of details of Iron Bridges, reproduced in wood to one-third scale, by Carl Bock, of Dresden; full size details of top and bottom chord connections of an Iron Truss, giving an exact representation, from an existing bridge, of the American system of pin connections; full sized details of a Pratt Truss, with wooden chords; model of a complete Howe Truss railway bridge, on a scale of one-twentieth; photographs and lithographs of the constructions of the best American bridge companies; set of photographs of Fourth Avenue Improvement, New York city; working drawings of a number of bridges; set of samples of rolled shapes in iron, etc. This collection is receiving additions from year to year by gifts and by purchase, and is invaluable to the student. The latest and best books on professional subjects are added yearly to the library, where they are accessible to all, and frequent references are made to them in the class room, as the various subjects are brought forward.

Contemporaneously with this course of study the class are required to work out problems in engineering design, or the application of theory to actual cases. The students are furnished with the usual data for a design, and the kind or type of structure is indicated. They are then expected to make the necessary calculations for proportioning the different parts, and to present, at a specified date, complete working drawings, with full details and figured dimensions, accompanied by bills of materials. The graphical method is applied to each problem.

A very extended and complete course of Mechanical Drawing, with kindred studies, is pursued during the greater part of the four years. It commences in the Freshman year, with Warren's Plane Projection Drawing and the first principles of coloring, shading, determination of shadows, isometric projection, etc.; the class next take up Descriptive Geometry, with construction of original problems in the drawing-rooms, and close with practice for one-half a semester in Free-hand Drawihg. In the Sophomore year the students advance to Topographical Drawing and the use of Conventional Signs, Ornamentation and Lettering; Mechanism, with lectures on the principles and drawings of parts of Machines. In the second semester they are instructed in Shades and Shadows, Linear Perspective, and Drawing for Stone-Cutting. Examples from numerical data are always given, and working drawings are made from these data. In the Junior year, plans of surveys, plane table work, and finished map and profile of the railroad line run by the class are made. The Senior class are occupied with the designs in Engineering Construction, and later, with their Thesis Drawings.

Besides the course of lectures on Pure Mechanism, a course is given, in the Senior year, upon the principles of Machine Construction, and an explanation and analysis of the action of the Prime Movers;—Turbines and other Water Wheels, the Steam Engine, etc. Portions of Machines, Working Models of Turbines, the Steam Engines and Pumps running in the University buildngs, Drawings, Photographs, etc., are used to illustrate the instruction.

The drawings made by the different classes during the year are retained until the close of the same, when they are displayed, at Commencement, in the several drawing-rooms, to those who may desire to inspect them.

Examinations, usually written, are held at the close of each study, or at the end of each semester. But at any time, without previous notice, the classes may be examined on any portion of their previous work, to test their actual knowledge, and as much account will be made of the results of such examinations as of the regular ones, to determine the student's fitness to pass in that branch.

REQUIREMENTS FOR ADMISSION.

The requirements for admission are the same as those for admission to the Scientific Course, except in Botany. They may be found on page 35.

THE COURSE OF STUDY.

The course of study at present pursued is as follows, the technical branches being printed in SMALL CAPITALS. (Those branches not technical will be found much more in detail on pp. 39-46.)

FRESHMEN.—*Mathematics.*—Part III. of Olney's Geometry. Plane and Spherical Trigonometry. Part III. of Olney's Algebra, or an equivalent in other authors.

GEOMETRICAL DRAWING.—Warren's Plane Projection Drawing. Use of India Ink and Water Colors. Isometric Projection.

DESCRIPTIVE GEOMETRY.—Church's, and Drawing of Problems in Descriptive Geometry.

French.—Translations from French into English, and from English into French. French Composition and Conversation.

English Language.—Lectures. Gilmore's Art of Expression. Exercises in Elocution and in Grammatical Criticism.

Rhetoric.—Lectures; Hill's Rhetoric. Exercises in English Composition.

Botany (Optional).—Elements of Structural and Systematic Botany.

FREE-HAND DRAWING.

SOPHOMORES.—*Mathematics.*—General Geometry and Calculus.

Physics.—Mechanics, Acoustics, and Optics. Deschanel's Textbook. Lectures.

DRAWING.—Ornamentation and Lettering. Topographical Drawing. Lectures on Principles of Mechanism. Machine Drawing; from Models and Machinery. Shades and Shadows, Church's. Linear Perspective. Stereotomy.

Chemistry.—Elementary Chemistry. Heat, Electricity and Magnetism. Lectures.

Astronomy.—Descriptive.

English.—Essays.

JUNIORS.—SURVEYING.—Lectures. Theory and adjustments of Level, Transit, Compass, Solar Compass. Plane Table, and Sextant. Henck's Field-Book for Engineers. Rankine's Civil Engineering, Part III., Chap. I. Levelling, Topography, Staking out Work, Computation of Quantities, Preparation of Estimates, Field Practice, Drawing of Plans, Maps, and Profiles; all with special reference to the details of actual practice.

English Exercises.—*Elective.*

ASTRONOMY.—Computation of Time, Latitude, and Longitude.

Mathematics.—General Geometry and Calculus.

History.—Mediæval and Modern History; Lectures.

Analytical Mechanics.—Wood's Analytical Mechanics, with Lectures.

German.—Whitney's Grammar, Exercises and Reader. German Composition and Conversation.

SENIORS.—CIVIL ENGINEERING.—Rankine's Civil Engineering, Parts II. and III., and Lectures. Materials and Structures. Principles of Stability and Strength, Resistance of Materials, Beams, Trusses, Girders, Roofs, Bridges, in Wood and Iron; Arches in Stone and Iron;

Stress Diagrams and Graphical Methods; Earthwork, Masonry, Retaining Walls, Foundations, Tunnels, Flow and Distribution of Water. Sanitary and Hydraulic Engineering, Drainage, and Sewerage, Canals and Tidal Works.

ENGINEERING DESIGN.—Original Problems and Designs for Roofs, Bridges and Structures of Wood, Iron and Stone. Working and Detail Drawings; Bills of Materials, Diagrams and Strain Sheets.

MACHINERY AND PRIME MOVERS.—Theory and Construction of Machines. Water-Wheels. Steam Engine.

Mineralogy and Geology.—Mineralogy and Lithology. Dynamical and Structural Geology.

German.—Study of German continued.

Elective.—Chemistry, Astronomy, Engineering Design, etc.

Preparation of Graduating Thesis.

ADVANCED STUDIES.

An advanced course of study is offered to graduates of the Civil Engineering Course and to Resident Graduates. It will consist of:

CIVIL ENGINEERING.—Further investigations of the Theory of Construction, more especially in the direction of Continuous Girders, Revolving Draw-Spans, Rigid and Braced Arches, etc.

Also a more extended course on the Steam Engine and other Prime Movers.

PROJECTS IN ENGINEERING.

MATHEMATICS.—Calculus of Variations.

ASTRONOMY.—*Theoretical Astronomy.*—Numerical Calculus, Theory of Interpolation and Quadratures, Method of Least Squares. Calculation of the special and general Perturbations of Planets and Perturbations of Comets.

PHYSICS.—Work in Physical Laboratory and Mathematical Theory of Light and Sound. Heat, Electricity and Magnetism.

CHEMISTRY.—Qualitative and Quantitative Analysis.

GERMAN AND FRENCH.—Advanced Studies.

II. SCHOOL OF MINES.

At the session of the State Legislature in 1875, an act was passed to provide for the establishment of a School of Mines at the University. In this act provision was made for the appointment of a Professor of Mining Engineering, a Professor of Metallurgy, and a Professor of Architecture and Design, with the necessary assistant instructors. A liberal appropriaation was also made for the purchase of special apparatus and for the general equipment of the school. In compliance with this act of the Legislature, the school was opened for the reception of students in September, 1875, and steady progress has been made in the fitting up of the metallurgical laboratory, and in securing the necessary appliances for imparting the highest theoretical and best practical instruction possible.

The requirements for admission to the School of Mines are the same as those for admission to the Scientific Course, except in Botany. See page 35.

The regular course of study covers four years, but students may be admitted to advanced standing, if properly qualified, at any time prior to the beginning of the fourth year. Those who complete the full course of study, pass all the required examinations, and present a satisfactory thesis upon some topic connected with mining, or metallurgy, will receive the degree of Mining Engineer. Special students, not candidates for a degree, may also be allowed to take such portions of the course of study as they may be found qualified, upon examination, to take with profit.

For the first two years, the studies pursued by the students in this School are nearly the same as those pursued by the candidates for the degree of Civil Engineer. In the last two years of the course, some of the studies of the Civil Engineering course are taken, but the chief attention is directed to the subjects of Mineralogy, Geology, and Chemistry, with their applications to Mining, Metallurgy, and Assaying. The details of mining and metallurgical practice are taught in the fourth year.

COURSE OF STUDY.

FRESHMEN.—*Mathematics; French; Descriptive Geometry; Geometrical Drawing; English Language*; *Rhetoric; Free-Hand Drawing.*—Same as in the Civil Engineering Course.

SOPHOMORES.—*Mathematics; Physics; Chemistry; Descriptive Astronomy; Essays.*—Same as in the Civil Engineering Course.

German.—Whitney's Text-books.

JUNIORS.—*Mathematics; Analytical Mechanics; Land Surveying and Field Work.*—Same as the Civil Engineering Course.

Mineralogy and Lithology.—Lectures. Dana's System of Mineralogy. Von Cotta and Lawrence's Lithology. Systematic Practice in determining minerals and rocks by means of their physical properties.

Analytical Chemistry, qualitative and quantitative. See page 79.

SENIORS.—*Geology.*—Dana's Manual of Geology. Lectures. Economic Geology. Phenomena of Veins and Mineral Deposits. Von Cotta's Treatise on Ore Deposits, translated by Prime. Special Geology of Mining Districts. Palæontology.

Analytical Chemistry.—Examination of fuels, furnace products, slags, and refractory materials. Gas analysis, analysis of air of mines.

Assaying.—See page 80.

Mining Engineering.—Lectures, with constant reference to standard works. Explorations, boring, shaft sinking, tunnelling, laying out of mines, excavating, motors, transportation, hoisting, ventilation, drainage and pumping, the water supply, treatment of fires in mines, ore dressing, and the elucidation of the principles involved in each case.

Mine Surveying.—Lectures. Practice upon problems and in plotting. Study of plans and sections of mines.

Metallurgy.—Lectures, with frequent reference to the works of Percy, Kerl, Phillips, and others. Principles of smelting; fuels; furnace construction; fire-proof materials; problems in calorific power and calorific intensity; slags, special processes for copper, lead, silver, gold: metallurgy of iron; varieties of iron and steel; treatment of ores containing arsenic, antimony, nickel, cobalt, bismuth, tin, and other metals.

Resistance of Materials; Machinery and Prime Movers.—With Civil Engineering Seniors.

For the first two years the students of the School of Mines pursue nearly all their studies in connection with the Civil Engineering classes; but for the remainder of the time the separation between the courses of Civil and Mining Engineering is more marked. For details relating to the branches pursued in common in the two courses, reference is made to the remarks found under the head of Civil Engineering, page 61.

The elements of *Chemistry,* in connection with the phenomena of heat, electricity and magnetism, are taken up by lectures and recitations in the second semester of the Sophomore year. *Analytical Chemistry* is begun in the Junior year, and is kept up during two years. For further information upon this point see pages 77 and 78.

The course in *Mineralogy* and *Lithology* is made thorough and practical. The first subject in order is Crystallography, which is fully illustrated by means of sciopticon projections and by a large collection of wooden models, with which each student will be obliged to make himself familiar. A set of over sixty glass models, imported from Germany, adds materially to the facilities of instruction in this branch of the subject. Following Crystallography. the other physical properties of minerals, such as hardness, lustre, diaphaneity, color and structure, are taken up in turn, and the student is made familiar with their relative importance as means of identifying mineral species. Special descriptive Mineralogy comes next, and the more important species of minerals will be studied in detail, with constant reference to Dana's System of Mineralogy. Upon the completion of the descriptive portion of the subject, the study of Lithology is pursued in a similar manner, necessitating a constant application of the knowledge gained in the preceding part of the course.

The mineralogical cabinet contains about 6,000 specimens, embracing all the varieties of iron, copper, and silver ores and their associated minerals from the different localities of the Lake Superior mining district, as well as rare collections from other States and from foreign lands. In addition to the large cabinet, a working collection of nearly a thousand specimens of the more common minerals, ores, and rocks in all their varieties and groupings is freely accessible to the students for study and practice, under suitable restrictions to prevent any unnecessary damage to the specimens.

Upon the completion of the course in *Mineralogy and Lithology*, the subject of *Geology* is taken up and continued through the whole of the Senior year. The subject is taught by lectures, recitations, and the free use of the extensive geological collections belonging to the University. See pp. 14 and 15. Particular attention is paid to the geology of mines and mineral districts, and to the modes of occurrence of mineral substances which have an economical or commercial importance. Palæontology is taught so far as to enable the student to recognize the leading American fossils. The several State Geological Reports are referred to for details relating to the mineral wealth of the country, and the methods and objects of geological surveys will be explained.

In *Mining Engineering* the instruction is given mainly by lectures. The machines in use at the best mines are described, and the mutual relations of parts explained and illustrated with the aid of plates and diagrams; and the different operations connected with the discovery, opening, development, and working of mines are studied in their proper order. Models of mines and mining machinery will be accumulated as rapidly as circumstances admit. A very valuable model of a stamp mill has been given to the University by the Calumet and Hecla Mining Company.

The facilities for instruction in *Metallurgy* are of a very high grade. This branch is taken up in the Senior year, after a solid foundation has been laid by nearly two years of work in the Chemical Laboratory. Instruction is given by means of an extensive course of lectures and recitations upon the more theoretical aspects of the subject, and by a thorough drill in the fundamental principles upon which all successful smelting operations have to be conducted. A large and convenient Metallurgical Laboratory has been recently fitted up in connection with the Chemical Laboratory. It contains already a small Blake crusher, a California stamp mill with two stamps driven by steam power, four cupel furnaces, four large wind furnaces, a lathe and a blacksmith's forge and anvil. Additional apparatus is to be procured before the end of the current year. A large quantity of ores and furnace products has been obtained from the Wyandotte Silver Smelting and Refining Company, and from Nevada, to which additions will be made from time to time. The ores of the Lake Superior region will always be fully represented. In this laboratory the subject of assaying can be taught to great advantage.

The formation of a metallurgical and industrial cabinet will also be made an important duty in connection with this department. A model collection of iron ores and furnace products has been received for this collection from Cincinnati, and a set of over 250 specimens, illustrating the iron and copper industries of the Lake Superior region, has lately been sent from Philadelphia, being a part of what was displayed at the Centennial Exhibition. It is hoped that numerous contributions will be made to this cabinet from friends of the University and of this School.

ARCHITECTURE AND DESIGN.

The formal instruction in Architecture and Design which was begun in 1876, is suspended in consequence of the curtailment of the resources of the University. But it is hoped that at no distant day this instruction may be resumed.

MECHANICAL ENGINEERING.

While no course of instruction looking to this profession has been established, the greater part of the studies prescribed for the students in Civil Engineering will be found needful by those students in Selected Studies who may wish to devote especial attention to this branch. In the Senior year, the instruction more akin to Mechanical Engineering is: Pure Mechanism, or the General Principles of Machinery, including Gearing, Cams, Screws, Cranks and Levers, with Problems and Machine Drawing; also, lectures upon the Prime Movers, Water Wheels and the Steam Engine. This work may be taken by students in Selected Studies, one year earlier, in place of Surveying, and in the next year they can take up Rankine's "Machinery and Millwork," and Rankine's "Steam Engine and other Prime Movers," a more extended course than is pursued by the other classes. They may also have practice in the Chemical Laboratory in Qualitative and Quantitative Analysis, with special reference to the Metallurgy of Iron and Steel.

III. SPECIAL AND ADVANCED COURSES IN SCIENCE.

I. MINERALOGY AND GEOLOGY.

The *general* course in these two sciences covers nearly two semesters, during which the students attend the same exercises as those of the Classical and Scientific courses, with the addition of special practice hours.

Advanced students, or those who have completed the general course, will be furnished with the requisite facilities for a further prosecution of their studies in connection with the special course in Palæontology or with the classes in the School of Mines.

II. ZOÖLOGY.

Seniors of the Classical and Latin and Scientific courses electing Zoölogy for the first semester, will attend a course of lectures in Systematic Zoölogy, illustrated with specimens from the collection in the Museum.

Seniors of the Classical and Latin and Scientific courses electing Zoölogy for the second semester, will be given special work in identifying species of birds, reptiles, or other groups of animals. The specimens for study will be furnished by the University.

The kind of work done during the second semester by Seniors of the above mentioned classes will make it necessary for them to have taken the course of lectures given in the first semester, or their equivalent in Systematic Zoölogy.

Seniors of the Scientific course electing Zoölogy, will be given special work in the identification of species, during one or both semesters, as they may elect.

Advanced students will be received into the classes of Seniors electing Zoology; or if too far advanced to get profit from these will be given special work.

III. BOTANY.

Special courses in Botany are given during both semesters of the Senior year.

In the first semester, *Structural and Physiological Botany* is taken up. The practical work will consist of,—first, the microscopical examination of plant tissues, illustrated by drawings and descriptions, and tested by the identification of unknown vegetable substances in powder; second, investigation of the physiological data for plants by means of instruments made for the purpose. This part of the course will be enlarged as rapidly as the necessary instruments can be provided. The practical work will be accompanied by lectures and recitations. The books of reference are "Sachs's Text-book of Botany," and "Handbuch der Experimental Physiologie," Johnson's "How Crops Feed," and "How Crops Grow," and "Harrington's Microscopical Examination of Crude Drugs and other Vegetable Products."

In the second semester a course in *Cryptogamic Botany* is continued to the end of the year. A practical study of the leading groups of Cryptogamic plants, with observations of their anatomy and physiology, is carried forward in connection with the lectures. Special attention is paid to the study of Fungi and their relations to other plants, and original investigation in this direction is encouraged as much as possible. Sachs's "Text-book of Botany," Hooker and Baker's "Synopsis Filicum," Sullivant's "Icones Muscorum," an edition of Gray's Manual of Botany, containing the Mosses and Hepaticæ, Cook's "Handbook of the British Fungi," Tulasne's "Selecta Fungorum Carpologia," and DeBary's "Morphologie und Physiologie der Pilze," are among the most important books of reference for this course.

These courses will be made as practical as possible. For this purpose the student will be expected to apply for a table in the MICROSCOPICAL LABORATORY, where all the necessary materials, microscopes, and other instruments will be provided at a cost only sufficient to cover actual expenses on the part of the University.

Instruction is given in Practical Microscopy, the use of Micro-Chemical Reagents, and other methods of observation, in drawing and measuring from the Microscope, etc. The

Microscopical Laboratory is open every morning from 8½ to 12½ o'clock. The charge for the use of Microscopes, other instruments and materials, is at present fixed at five dollars for each semester or fraction of a semester, which amount must be deposited by each student with the Steward of the University before his application for a table can be entered. Students are responsible for the apparatus furnished them, and are required to make good any injury to the instruments under their charge.

Among the works of reference to be used in the Laboratory are Carpenter's "Microscope," the "Micrographic Dictionary," Schalt's "Mikroskop und seine Anwendung," Flückiger and Handbury's "Pharmacographia," Berg's "Anatomischer Atlas," etc.

The Botanical Course in the School of Pharmacy is described on pages 81 and 82.

IV. PHYSICS.

The study of Experimental Mechanics, Acoustics and Optics, is taken up during the first semester of the Senior year. The text-book, Deschanel's "Natural Philosophy," is largely supplemented by lectures and experiments, on all of which regular recitations are had. Heat and Electricity are taken up in the second semester in connection with General Chemistry.

Under an appropriation by the last Legislature arrangements were made for opening a Physical Laboratory at the beginning of the second semester, February 18, 1878. The rooms devoted exclusively to the Department of Physics extend in a direct line over 125 feet, and are lighted from the North, East and South, and provided with steam, gas and water.

Here a systematic course of physical measurements is provided; such a course as will give the student familiarity with apparatus and its manipulation, a clearer understanding of the methods by which the important tables of the text-book have been made out, and confidence in their accuracy. For this purpose apparatus has been provided for the accurate determination of weights and measures, linear and cubic, of specific gravity, elasticity of bodies, strength and stiffness of beams, and simple structures as trusses, bridges, etc.; for flow of liquids and gases, for many measures of rates of vibration of sounding bodies, of the index of refraction in solids and liquids, of wave length of lines in the solar spectrum and in the spectrum of common materials, of the intensity of light, and of the amount of light absorbed by various shades, etc.; of the strength of galvanic batteries, and the resistance of conductors, of specific and latent heat, etc., etc.

The plan followed will be in the main the one developed through many years of successful operation at the Massachusetts Institute of Technology. Pickering's "Elements of Physical Manipulation" will be used as a text-book. It is, of course, understood that in this course the students perform all the experiments themselves.

As the schedule is arranged, work in the Laboratory comes as an elective for Seniors, Juniors (Scientific Course), and Sophomores (Engineers), but its advantages are opened to special students, who have had sufficient previous study of Physics to profit by the course.

Those desiring to become familiar with the ordinary apparatus and lecture experiments can also be accommodated to a considerable extent.

In case a sufficient number of students who expect to teach desire it, during the spring, a short course of lectures will be given, illustrated by such easy experiments as can be repeated in any school with little trouble, and at a very trifling expense. No examination will be required in connection with this course.

No extra fees are required for any of the work in Physics.

V. PURE MATHEMATICS.

The description of the work in Pure Mathematics will be found on page 43.

VI. ASTRONOMY.

The Course in Higher Astronomy embraces two years, and begins with the first semester of the Senior year.

The following subjects give direction to the lectures of the course:

Formation of the Fundamental Equations of Motion. Integration of the Equations for Undisturbed Motion, and Determination of the Elements of the Orbit. Theory of Interpolation. Calculation of Ephemerides.

Calculation of the Orbits of the Celestial Bodies from Three or more Observations. Correction of the Elements. Combination of Observations by the method of Least Squares. Special and General Perturbations. Determination of Time, Latitude and Longitude.

Theory of the Instruments.

During the course the student has access to the instruments of the Observatory, under the special direction of the Professor and is permitted to take part in the observations.

VII. MODERN LANGUAGES.

Large facilities are furnished for the study of the Modern Languages, with reference to the oral use of them, or to the reading of foreign treatises on Science. A detailed description of the work is found on page 41.

VIII. CHEMISTRY.

The preparation for giving instruction inGeneral Chemistry, Chemical Physics, Analytical and Applied Chemistry, Metallurgy and Pharmacy, are most ample and complete. The lecture-room in Chemical Physics and General Chemistry will accommodate nearly five hundred students, and is arranged with elevated seats, having special reference to experimental illustration. The lectures are illustrated by the use of a large collection of the most approved apparatus, covering the subjects of Heat, Spectrum Analysis, Electricity and General Chemistry. The use of the lantern, of the most approved construction, lighted by the calcium light of electric discharge, enables the Professor to exhibit delicate experiments upon the screen, so as to be seen by a large audience. These lectures are made as practical, in the ordinary affairs of life, as strict science will permit. The instruction in Metallurgy is illustrated by the use of a rare and expensive collection of furnace models constructed upon an accurate scale; embracing models for the smelting of Iron and Copper, Lead, Silver, Zinc, and for the manufacture of Steel and Glass.

The Laboratory of Analytical and Applied Chemistry occupies a ground space of 15,000 square feet, and contains six work-rooms devoted to different branches of experimental study, furnishing in all one hundred and seventy-five students' tables. Each table is supplied with gas, water, and wash-basin and waste-pipe, and with suitable apparatus. Each student has an average area of fifty-five square feet, and an air space of eight hundred cubic feet. The Laboratory is furnished with sand, water and steam baths, drying ovens, and exhaust connections for filtration. In the balance room, accurate balances are separately assigned to the students in quantitative work, and microscopes are provided in the microscopic room for those who require these instruments. The general furnace room, (30 by 100 feet) is supplied with assay, blast, and other metallurgic furnaces, and with the apparatus for ultimate organic analysis. The standard works of reference for Chemistry and the allied sciences are kept accessible to the students. The Laboratory rooms are well ventilated by Sturtevant fan ventilators.

EXPENSES OF THE LABORATORY.—It is the design of the Regents that the chemicals and apparatus actually consumed in the individual manipulations of the student, shall be paid for by him. With this view, the student on entering the Laboratory makes a deposit of ten dollars, a complete suit of apparatus is inventoried to him, and from time to time additional supplies are furnished. An accurate account is kept. On leaving the Laboratory he is credited with what may remain unconsumed, and the balance is struck. All supplies are furnished the student at the printed price current of New York dealers. The Laboratory expenses of students will vary with their prudence and economy. Experience has shown that the average is one dollar and twenty cents per week for all Laboratory courses.

IX. ANALYTICAL AND APPLIED CHEMISTRY.

1. *Requirements for Admission to the Laboratory.*—Before commencing work at his table, the student must be able to write the formulæ of salts. To do this he must be prepared in the constitution of the

acids and the quantivalence of the metals, and in the rules of combination. For this preparation any text-book of elementary chemistry (written in the modern notation) may be used. The completion of qualitative analysis is a requisite to admission in any other course of laboratory work.

2. *Qualitative Analysis.*—(1) Study of the characteristics of the acids and bases in *known material.* This study is pursued by operations of analysis, as required in identifying and separating compounds; operations of synthesis, showing the action of compounds upon each other; by use of the text-books of analysis and of general chemistry, for each acid and base; and by constructing statements of all chemical changes, in equations. When able to pass examination upon the means of identifying and separating each acid and base, and upon the incompatibilities of their salts, and to write and explain the chemical equations (which must now be submitted with notes of the work in permanent form) the student is passed to the latter part of qualitative work. (2) *The Analysis of Unknown Materials.* Each student receives a separate set, comprising sixty unknown mixtures, (solids and solutions). After analysis of each five mixtures, the student reports his results. When the analyses have all been correctly reported, and the study of oxydizing and reducing agents is completed, the student receives the final qualitative examination. The text-book is Douglas and Prescott's Qualitative Analysis, and for general Chemistry, Bloxam's Chemistry, Eliot and Storer's, or Miller's Inorganic. Reference should be made to Storer's Dictionary of Solubilities, and Watts's Dictionary of Chemistry.

3. *Blow-Pipe Analysis.*—The determination of one hundred representative minerals by qualitative blow-pipe analysis. Text-book, Brush's Manual, with the secondary use of Dana's Manual of Mineralogy, and with reference to Dana's System. The last mentioned work is provided at the Laboratory. Plattner's Manual (required for the work in assaying) is a valuable work of reference in this course.

4. *Quantitative Analysis.*—(1) Determinations of Density of Solids and Liquids. (2) Gravimetric Determinations. (3) Volumetric Determinations. (4) Gravimetric Separations. (5) Industrial and Commercial Analyses, comprising work upon the materials of that branch of applied Chemistry chosen by the student, as follows: For Metallurgy and Mining,—ores, gangues, slags, fluxes, furnace materials, fuels, pig iron and steel, etc. For Manufactures,—the crude materials and raw and refined products of the chemical manufactures, paints, glass and pottery, cements, etc. For Agriculture,—fertilizers and ash of plants. The analysis of mineral and potable waters is included in this

division. In the class room a study is made of quantitative determinations and separations, extending beyond those performed in the laboratory. Text-book: Fresenius's Quantitative Analysis, with reference to the works of Storer, Thorpe, Noad, Crookes, Normandy, Rammelsberg, and others, in the library.

5. *Assaying.*—(1) Practice in the *blow-pipe* assay of the precious metals, copper and lead, taken in alloy and in ore. Guide, Plattner's Manual of Qualitative and Quantitative Analysis with the blow-pipe. (2) *Volumetric* determinations of iron and silver—following Fresenius. (3) The *crucible* assay of the precious and base metals, from their ores. Mitchell's Assaying is the work most in requisition, for methods by crucible and scorification.

6. *For the Detection and Estimation of Impurities* in articles of commerce the analyst requires training in Qualitative Analysis (2), Quantitative Analysis (4), Proximate Organic Analysis (Pharmacy 12), and in Pharmaceutical Botany and Microscopy (Pharmacy 7). With and after the work in Proximate Organic Analysis, there is practice in analyses of foods, condiments, alcoholic liquors, oils, soaps, medicinal mixtures, etc. The exercises in the recognition and estimation of impurities and substitutions embrace examinations of articles used in the various industrial arts and in the household, or brought in question in the service of hygiene. Lectures are given on these subjects as explained under Pharmacy 11 and 13. Besides the books elsewhere referred to, the recent works of Wanklyn (Milk, Tea, Coffee, Cocoa, etc.) Hager's Untersuchungen, the (London) Pharmaceutical Journal for the last five years, and the London Analyst, are especially useful.

7. *Toxicology.*—Analysis of food material or tissue material in assumed cases of poisoning and in cases instituted with animals,—including the chief organic and inorganic poisons. Lectures and class drills accompany the laboratory work. Reference is made to the works of Otto, Wormley, Reese, Taylor.

8. *Physiological and Pathological Analysis.*—Analyses of Urine, normal and abnormal, by qualitative, volumetric, and microscopical methods. Examinations of tissue materials, excretions, blood-stains, etc. Reference to the works of Thudicum, Hassall, Beal, Carpenter, Burdon-Sanderson.

IV. SCHOOL OF PHARMACY.

It is the design of this department, which is now organized as a distinct school, to qualify its graduates to become practical pharmacists, general analysts, and chemical manufacturers, and to give them the training of systematic work in exact science. Class instruction is made to coöperate with laboratory practice in all the topics of the course. The class-work comprises both recitations and lectures—none of which are repeated to the same students. The required laboratory work employs about four hours daily through the two collegiate years, each student advancing independently and receiving separate examination at the completion of each branch required.

It is REQUIRED FOR ADMISSION to the School of Pharmacy, that the student possesses a good knowledge of the English language, as determined by written examination. The examination for admission will be held on the 30th day of September at 9 A. M.

REQUIREMENTS IN THE FIRST YEAR.

1. *Chemical Physics and Inorganic Chemistry.*—Illustrated lectures three and four times a week, with the use of Miller's Chemical Physics and Attfield's Chemistry. Remsen's Theoretical Chemistry is advised as additional aid. The examination in chemical physics is held just before the spring recess; in inorganic chemistry at the close of the first year.

2. *Analytical Chemistry.*—Lectures and class-drills upon the laboratory work, and upon chemical problems, with recitations from the text-books in Qualitative daily until the spring recess.

3. *Pharmacy.*—The study of chemical problems, and pharmaceutical and manufacturing operations, by lectures and recitations, three to five times a week through the first semester. Examinations at the close of the course.

4. *Botany.*—Recitations with Gray's Lessons and practical studies with fresh plants (use of Gray's Manual) daily from the spring recess to the week before the June Commencement. Special attention is given to indigenous medicinal plants.

5. *Qualitative Analysis.*—Before commencing work at his table the student must be able to write the formulæ of salts. To do this he must be prepared in the constitution of the acids and the quantivalence of the metals, and in the rules of combination. Attfield's Chemistry is advised for this preparation, but any text-book of elementary chemistry (written in the modern notation) such as Roscoe's or Miller's Introduction, may be used. The completion of Qualitative Analysis is a requisite for admission to any other course of chemical laboratory work.

Students not fully *prepared in chemical notation* are requested to present themselves at the laboratory class-room, one week before the opening of the term (Sept. 24, 1878, 9 A. M.) for daily exercises in this preparation.

The qualitative work is divided as follows: (1) Study of characteristics of the acids and bases in *known material.* When able to pass examination upon the means of identifying and separating each acid and base, and to give the chemical equations, the student is passed to the latter part of qualitative work. (2) The *analysis of Unknown Material.* Each student receives a separate set of unknown mixtures, (solids and liquids.) After analysis of each mixture, the student reports his results. When the analyses have been all correctly reported, and the study of oxidizing and reducing agents is completed, the student receives the final qualitative examination. The text-book is Douglas and Prescott's Qualitative Analysis, and for general Chemistry Attfield's or Miller's Inorganic. Reference is made to Storer's Dictionary of Solubilities, and Watts's Dictionary of Chemistry.

6. *Quantitative Analysis.*—(1) Determinations of Densities; (2) Gravimetric Determinations; (3) Volumetric Determinations; (4) Gravimetric Separations. *Class-Drills* in quantitative analysis are held three times a week, requiring a study of all the chief separations as well as those performed in the Laboratory. Text-books, Fresenius's Quantitative Analysis, and Thorpe's Quantitative Analysis.

REQUIREMENTS IN THE SECOND YEAR.

7. *Pharmaceutical Botany.*—Exercises daily through the first semester, as follows: Examination of fresh plants continued for the first six or eight weeks. Then lectures or exercises on structural botany, with reference to the identification of drugs of vegetable origin and the detection of adulterations in foods, condiments and medicines. The lectures alternate with work in the Microscopical Laboratory, embracing a systematic course in examination of a series of commercial articles, with use of Harrington's Microscopical Examination of Crude Drugs and other Vegetable Products. Examination at the close of the first semester. Examination when concluded.

8. *Crystallography.*—Twelve to fifteen lectures on systematic crystallography with exercises in identifying crystals, in the first half of the first semester.

9. *Materia Medica.*—Lectures three times a week for four or five months. A collection of crude drugs and pharmacopœial preparations in the chemical laboratory, is used by the class in study for the recitations. Text-book, H. C. Wood's Materia Medica. Examination, just before the spring recess.

10. *Organic Chemistry.*—Lectures on the rudimentary chemistry of carbon compounds. Foods, tissue substances, materials of industrial importance. *Toxicology* by lectures. From the beginning of the second semester to the spring recess, four times a week.

11. *Pharmacy.*—First, of *inorganic* materials and the technical history of chemical wares, by lectures and recitations, from works of reference and from laboratory work, until the Christmas vacation. Second, of *organic* chemistry and materials, lectures, and recitations from Proximate Organic Analysis, until the week before the June Commencement. For the first six months of the term, three times a week: for the last three months of the term, five times a week.

12. *Organic Analysis.*—(1) Ultimate Organic Analysis; (2) Verification of the reactions of carbon compounds in a series of known mixtures; (3) Qualitative Analysis of a series of organic mixtures; (4) Quantitative estimation of organic drugs. Text-book, Prescott's Proximate Organic Analysis.

13. *Commercial Examinations.*—The detection and estimation of impurities in articles important in commerce,—such as medicines (both authorized and proprietary), condiments and foods, pigments, detergents and chemicals used in the industrial arts—the examinations being chemical and microscopical, as required. The material will be separately assigned to each student. Students are invited to propose articles and to assist in collecting a sufficient number of samples. The work requires the use of all the text-books before mentioned, with reference to the works of Hassall, Wanklyn, Normandy, Fluckiger and Hanbury, and other authorities in the library.

14. *Toxicology.*—Analysis of food material or tissue material in assumed cases of poisoning and in cases instituted with animals,—including the chief inorganic and organic poisons. Lectures are given with the laboratory work. Reference is made to the works of Otto, Wormley, Reese, Taylor.

15. *Analysis of Urine.*—Normal and abnormal, by qualitative, volumetric and microscopical methods. Text-book, Harley. Reference to the works of Hassall, Beal, Thudicum, Burdon-Sanderson. The examination is held on completion of a course of lectures on this subject.

16. *Pharmacopœial Preparations.*—Exercises in each class, U. S. Pharmacopœia; in some of the more elaborate chemical productions; in the minor performances of extemporaneous pharmacy, and in reading and preparing prescriptions. Use of the U. S. Pharmacopœia with reference to the U. S. Dispensatory. The student derives advantage from ready access to Parrish's Pharmacy, and to Wittstein's Pharmaceutical Chemistry.

17. *The Thesis* for the degree of Pharmaceutical Chemist is required to embody the results of investigation by the student under direction of the Professor in charge of the subject chosen, which must be accepted by the Faculty as early as the first of April. The investigation may consist of examinations of articles in commerce or in nature, trials of methods of analysis, collections of natural articles, preparations or extractions of rare substances, improvement in methods of preparation, or personal research, in *any subject of the course.* A careful comparison of authorities must first be made and references given.

The required *text-books* are named in connection with the work for which they are used, as are also some of the *works of reference* most frequently used. Attfield's Chemistry is best for preparation for the laboratory work, and is convenient through the course. Students are not required to provide themselves with the works of reference, many of which are furnished at the laboratories. Storer's Dictionary of Solubilities and Watts's Dictionary of Chemistry should be very frequently consulted. The following works are also employed: Gmelin's Handbook of Chemistry; Bentley's Manual of Botany; Gray's Structural and Systematic Botany; Fresenius's Qualitative Analysis; Sutton's Volumetric Analysis; Storer's Cyclopœdia of Qualitative Analysis; Wittstein's Chemical Analysis of Plants; Wormley's Micro-Chemistry of Poisons; Otto's Poisons; Hassall's Analysis of Urine; Beale's Works; Hoffman's Medicinal Chemicals; Hassall's Adulterations; Wanklyn's Tea, Coffee and Cocoa Analysis; Prescott's Examination of Alcoholic Liquors; Vogel's Nahrungs und Genussmittel; Hager's Untersuchungen; Heppe's Chemischen Reactionen; Wagner's Chemical Technology; Zeitschrift f. analyt. Chemie; Pharmaceutical Journal; Planchon's La Determination des Drogues Végétales; Fluckiger and Hanbury's Pharmacographia.

The collegiate year in this school commences October 1st, and closes at the June Commencement. Graduates receive the degree of Pharmaceutical Chemist. Concerning expenses of laboratory work, see page 78. The average cost of material in the chemical laboratory has been one dollar and twenty cents per week for each student in Pharmacy.

The order of exercises is given on the following page.

ORDER OF EXERCISES.

FIRST YEAR—First Semester.

Class Work.

Hours.	
9½ to 10½	Analytical Chemistry (2)*—twice a week—until the holidays. Pharmacy (3)—three times a week—from holidays to the close. Chem. Physics and Inorganic Chemistry (1) three times a week.
8½ to 9½	Analytical Chemistry (2)—daily.
5 to 6	Chemical Physics and Inorganic Chemistry (1)—three times a week.

Laboratory Work.

1 to 5	Qualitative Analysis (5)—daily.

Second Semester.

Class Work.

9½ to 10½	Quantitative Analysis (6)—three times a week—from the recess to the close.
10½ to 11½	Pharmacy (3)—three times a week—until recess. Botany (4)—five times a week—from the recess to the close.

Laboratory Work.

1½ to 5½	Qualitative Analysis (5) (concluded) daily. Quantitative Analysis (6) daily.

SECOND YEAR—First Semester.

Class Work.

9½ to 10½ or..... or.....	Pharmaceutical Botany (7)—daily.
10½ to 11½	Pharmacy (11)—three times a week. Crystallography (8)—twelve or fifteen lectures.
11½ to 12½	Quantitative Analysis (6)—three times a week—to holidays.
5 to 6 or..... or.....	Materia Medica Lectures (9)—three times a week—for four months.

Laboratory Work.

1 to 5	Microscopic Analysis (7) daily. Toxicology (14) Anal. Urine (15) daily. Pharmacopœial Preparations (16) daily.

Second Semester.

Class Work.

9½ to 10½	to recess.	Pharmacy (11) three times a week—to recess.
9½ to 12½	after recess	Pharmacy (11) daily, after recess.

Laboratory Work.

1½ to 5½	Organic Analysis (12) daily. Original Work (13, 17) daily.

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* The figures in parentheses refer to the numbering of the subjects given in the preceding pages.

THE FACULTY

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The Polytechnic School.

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MOSES COIT TYLER, LL. D.,
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JOSEPH B. STEERE, PH. D.,
ISAAC N. DEMMON, M. A.,
P. R. B. DEPONT, B. A., B. S.,
CHARLES S. DENISON, C. E., M. S.,
ALFRED HENNEQUIN, M. A.,
CHARLES N. JONES, B. A.,
VOLNEY M. SPALDING, M. A.
OTIS C. JOHNSON, M. A.,
SAMUEL T. DOUGLAS, PH. B., PH. C.,
ABRAM V. E. YOUNG, PH. B., PH. C.,
VICTOR C. VAUGHAN, PH. D.,
HENRY B. PARSONS, PH. C.,
LOUISA M. REED, M. S.

STUDENTS.

CIVIL ENGINEERING.

SENIORS.

NAME.	RESIDENCE.
George Franklin Allmendinger,	*Ann Arbor.*
Clarence Oliver Arey,	*Whitewater, Wis.*
James Dick Du Shane,	*Connellsville, Pa.*
William V. Grove,	*Williamsville, N. Y.*
John E. Hanson,	*Ann Arbor.*
John Butler Johnson,	*Kokomo, Ind.*
Timothy Josenhans,	*York.*
Seymour Penny Morse,	*Highland.*
Charles Fernando Owen,	*Dearborn.*
James Sanderson,	*Detroit.*
Ossian Cole Simonds,	*Grand Rapids.*
Frank Leonard Sizer,	*Ottawa.*
Hiram Everett Terry,	*Avon.*

JUNIORS.

NAME.	RESIDENCE.
Joseph Allen Beaumont,	*Peru, Ind.*
Isaac Channing Goff,	*Cleveland, O.*
Charles Sumner Henning,	*Plano, Ill.*
Cicero Demerit Hill,	*Milwaukee, Wis.*
Brayton Daniel King,	*Ann Arbor.*
Irving K. Pond,	*Ann Arbor.*
Evert Van Pelt,	*Buffalo, N. Y.*
Andrew Wenzell,	*Detroit.*

SOPHOMORES.

NAME.	RESIDENCE.
Charles Carroll Brown,	*Indianapolis, Ind.*
John William Dorst,	*New Albany, Ind.*

NAME.	RESIDENCE.
James Wilfred McKinley,	*Newcastle, Pa.*
Duncan Wolcott Miller,	*Bowne.*
Frank Satterlee,	*Birmingham.*

FRESHMEN.

NAME.	RESIDENCE.
George Alfred Brown,	*Indianapolis, Ind.*
Randolph Willis Brown,	*Rochester, Minn.*
Francis Root Day,	*Chicago, Ill.*
John Evangelus Hathaway,	*Milwaukee, Wis.*
David Emery Hoover,	*Ionia.*
George Anthony Lederle,	*Detroit.*
Everett Marshall,	*Cleveland, O.*
W. Clayton Miller,	*Marquette.*
Theron Clarence North,	*Lansing.*
T. J. Mumford Starring,	*Detroit.*

SELECT STUDIES.

NAME.	RESIDENCE.
Theodore S. McCoy,	*Van Wert, O.*
Lewis Cass Woodman.	*Northville.*

MINING ENGINEERING.

SENIORS.

NAME.	RESIDENCE.
Henry Wick Judd,	*Flint.*
Eugene George Mann,	*Ann Arbor.*
Sidney Buckminster Wight,	*Detroit.*

JUNIORS.

NAME.	RESIDENCE.
Walter Scott Abell	*San Francisco, Cal.*
H. Throop Morley,	*Marine City.*
Thomas Henry Noble.	*Elk Rapids.*
Henry Camp Post,	*Grand Rapids.*
John Charles Quintus,	*Grand Rapids.*
E. Fred. Wood,	*Ann Arbor.*

SOPHOMORES.

NAME.	RESIDENCE.
John Ayers,	*Fort Smith, Ark.*
Samuel Lloyd Beaumont,	*Ann Arbor.*
Andrew Strong Deacon,	*Harrisonville, Mo.*
Frank Merritt Dunlap,	*Detroit.*
Frank Wood Loveland,	*Golden, Col.*
Charles Chase Whitacre,	*Chicago, Ill.*

FRESHMEN.

NAME.	RESIDENCE.
Herbert Augustus Hodge,	*Concord.*

ADVANCED ZOÖLOGY AND BOTANY.

RESIDENT GRADUATE.

NAME.	RESIDENCE.
Abram Sager Hall, Ph. B.,	*Saline.*

SENIORS.

NAME.	RESIDENCE.
David Noble De Tarr,	*Boone, Iowa.*
Paul Henry Hanus,	*Mineral Point, Wis.*

ADVANCED ANALYTICAL CHEMISTRY.

RESIDENT GRADUATE.

NAME.	RESIDENCE.
Branch H. Colby, B. S.,	*Ann Arbor.*

THE FACULTY

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VOLNEY M. SPALDING, M. A.,
OTIS C. JOHNSON, M. A., PH. C.,
SAMUEL T. DOUGLAS, PH. B., PH. C.,
ABRAM V. E. YOUNG, PH. B., PH. C.,
VICTOR C. VAUGHAN, PH. D.,
HENRY B. PARSONS, PH. C.,
LOUISA M. REED, M. S.

STUDENTS.

SECOND YEAR.

NAME.	RESIDENCE.
Frank Atwood Brooks,	*Goliad, Texas.*
Hulett White Calkins,	*South Lyons.*
Frederick K. Fernald,	*Adrian.*
Will. E. Finley,	*Hastings.*
Elbridge Dayton Gibson,	*Pontiac.*
William Andrus Hasbrouck,	*Battle Creek.*
Henry Heim,	*East Saginaw.*
Cyrus Wellard Heister,	*West Lebanon, O.*
William Kerr Higley,	*Ann Arbor.*
Oscar Herman Koehnle,	*Lincoln, Ill.*
Hugo Lorens Lupinski,	*Sheboygan, Wis.*
William Stewart McCay,	*Grand Rapids.*
Henry L. W. Meyer,	*Ft. Wayne, Ind.*
Theodore Fred Meyer,	*St. Louis, Mo.*
John Johnston Miller,	*Knoxville, Ill.*
Lucius Wright Moody,	*Ogdensburg, N. Y.*
Louis Ernest Seyffardt,	*Saginaw.*
Amasa D. Smith,	*Pewamo.*
Ellery Spencer,	*Lenox, Mass.*
Henry Stecher,	*Sheboygan, Wis.*
Hugo Thum,	*Grand Rapids.*
Perry Leland Townsend,	*Ann Arbor.*
Robert Henry Wallace,	*Lexington.*
George E. Wilson,	*Napoleon, O.*
Clinton Edwin Worden,	*Ann Arbor.*

FIRST YEAR.

NAME.	RESIDENCE.
Ira Austin Armstrong,	*Clifton, N. Y.*
James Wilson Ayers,	*Kalamazoo.*
Royal Frank Bowen,	*McGregor, Iowa.*

NAME.	RESIDENCE.
Charles H. Brunner,	*Fremont, Neb.*
Elizabeth H. Burchard,	*Winona, Minn.*
William Dennis Church,	*Ann Arbor.*
William Warren Cole,	*Morenci.*
Charles Whatefield Coons,	*Canton, O.*
Sidney Hollister Culver,	*Ann Arbor.*
Byron Francis Dawson,	*Rochester, Ind.*
Eddie David Drake,	*Detroit.*
William Dwight Eaton,	*Hannibal, Mo.*
Frank Frisby,	*Bethany, Mo.*
J. Harvey Fronefield,	*Phœnixville, Pa.*
William Grossman,	*Ann Arbor.*
Edwin P. Hawley,	*Cleveland, O.*
Sylvester Joseph Heimbach,	*Mottville.*
Philip Stanhope Houghton,	*Detroit.*
Clarence Bonito Hungerford,	*Northville.*
George Clinton Hueston,	*Northville.*
Paul Christen Jenson,	*Ann Arbor.*
Edward Keeler,	*Quincy.*
John Perry Kelley,	*Golden, Col.*
Theodore A. Laubengayer,	*Owosso.*
Robert Henry McMurdy,	*Niles.*
Henry John Meyer,	*St. Louis, Mo.*
Robert Fulton Mull,	*Phillipsburg, Pa.*
Ole H. Nelson,	*Alexandria, Minn.*
Louis Philip Orth,	*Ionia.*
Daniel Edward Osborne,	*Chardon, O.*
Arthur Sheldon Parker,	*Richland.*
Webber Richardson,	*Harvard Junc., Ill.*
Richard Taylor Robinson,	*Kenosha, Wis.*
Theophilus Schmid,	*Ann Arbor.*
Ferdinand G. Uhlich,	*St. Louis, Mo.*
Arthur Hube Vandivert,	*Bethany, Mo.*
Alfred Levi Walker,	*Wolcott, N. Y.*
John Fred Wallach,	*Chicago, Ill.*
Henry Wilcox,	*State Bridge, N. Y.*
William Clayton Willits,	*Ann Arbor.*
Fred. Lynn Wilson,	*Pontiac.*
Clifford Brown Wood,	*Chicago, Ill.*
Louis Newton Wood,	*Ann Arbor.*
Frederick Alleman Woodruff,	*Ann Arbor.*

DEPARTMENT

OF

Medicine and Surgery.

I. IMPROVED AND EXTENDED COURSE OF INSTRUCTION.

Within the last year important changes have been made in the course of instruction in the College of Medicine and Surgery.

The session is now extended to *nine months*, or the entire college year, commencing October 1st, and continuing until the last of June.

Students, however, who matriculated previous to 1877, will be allowed to continue the course on the basis upon which they entered the College, and present themselves for graduation, if they shall so choose, at the end of the the first six months of the session, but having the privilege of attending the other three months, when lectures upon other subjects than those embraced within the first six months will be given; and these students may, at their option, come up for graduation at the end of the college year in June.

In the new arrangement a graded course of instruction and study is provided, continuing three college years. In the first year special attention is given by those taking this fuller course to Anatomy, Chemistry, Physiology, and Materia Medica and Therapeutics, with appropriate work in the Chemical, Anatomical and Physiological Laboratories, and such examination of drugs in the Pharmaceutical Laboratory as will render them familiar with their sensible properties.

The *second year* of the course the students are to review the studies of the first year so far as may be necessary to prepare for their examination upon them, and in addition to take Pathology (including Pathological Anatomy and Pathological Histology), Hygiene or Preventive Medicine, Medical Chemistry, (Physiological and Pathological), including practical work in the Laboratory; and in addition, to attend such lectures on the practical branches, Didactic and Clinical, as may be thought advisable in each particular case.

At the end of the *second* year *final* examinations are to take place in Chemistry, Anatomy, Physiology, Preventive Medicine, Materia Medica and Therapeutics.

The *third year* the students are to review General Pathology, Pathological Anatomy, and Pathological Histology, but to devote themselves especially to the branches of Obstetrics and Diseases of Women and Children, Ophthalmology, Surgery and Practice of Medicine, and to the application in the Hospital and the College Clinics of the principles taught in the didactic lectures—receiving practical instruction and drilling in Diagnosis and Treatment, preparatory to the final examination which is to test their knowledge of diseases and their management, and their fitness for assuming the responsible duties of the Physician and Surgeon.

But students properly qualified may enter the College at any time and pursue such branches of study taught as they may select, receiving specific certificates for the time spent and for the subjects pursued. After the session of 1878-9, however, no student shall be recommended for the degree of Doctor of Medicine who has not passed a thorough and satisfactory examination on all the subjects taught in the extended course in the Department, and who has not been in regular attendance upon medical lectures in this or some other respectable school of medicine recognized by this college, for at least two full courses, the last of which must have been spent in this Department; and after this session of 1878-9, graduation will occur only at the June Commencement.

While students are earnestly advised to take the three years' course, (and those who are in attendance the three college years will need no other evidence of their time of medical study), yet only two courses are required for graduation, provided evidence is furnished that the candidate has been engaged in the study of medicine (including the time spent in the college) for the usual term of three years.

The final examination of all future matriculants will be conducted, in part at least, in writing; and during the course of study each candidate for graduation will be required to submit to written examinations, and may be called upon to write upon some theme assigned by the instructor or selected by the student, the essay, if required, to be defended before the class. In consequence of these exercises a final Thesis will not be required.

II. THE LECTURE COURSE.

In accordance with these arrangements the twenty-ninth annual course of lectures will commence on Tuesday, October 1st, 1878, and continue until the last Tuesday of June, 1879, with a recess during the holidays.

Four lectures will be delivered daily; and during the course frequent examinations will take place upon the subjects presented in the lectures. Clinics are held in the college every Wednesday and Saturday, for both medical and surgical cases, at which time examinations are made, prescriptions given, and surgical operations performed, gratuitously to patients, in the presence of the class.

III. TERMS OF ADMISSION.

Every candidate for admission to the Medical Department must be eighteen years of age, and must present to the Faculty satisfactory evidence of a good moral character.

Unless already graduates or matriculants of the University, or of some literary or scientific college, or graduates or advanced members of some academy or high school, or unless holding certificates from some public school board, as being properly qualified teachers, or unless having certificates based upon an examination of some regular medical society as being properly qualified to engage in the study of medicine, all candidates must be examined as to their elementary education and their fitness to enter the college and pursue properly and profitably the study of the profession. The examination will be in writing, and will include an account of the candidates' educational advantages, and answers upon such questions of Arithmetic, Geography, History, Forms of Government and current events as shall show their practical intelligence; and particularly will they be required to correct imperfect English so as to test their ability to express ideas correctly in writing. Since many present themselves a long time after completing their school education, the examination will not be technical, nor in the rules of school books, which are often soon forgetten, but it will be more to exhibit the results of previous training, and to indicate their present practical capacity, and their probable ability to become reputable members of the profession. Such an examination is believed to be quite as effectual in guarding the profession from the introduction of illiterate and unworthy members as the requirement of a limited specified amount of school-book knowledge, to be studied up for the occasion.

These preliminary requirements are not now of as high an order as it is hoped they will before long be made, but they are intended to be as exacting as is fairly practicable, and as is consistent with the interests and rights of the profession and the people.

Examinations will be held at 2 P. M., on Saturday and Monday, September 28 and 30, 1878. Candidates are required to present themselves on one of these days, as they are expected to be in attendance on the first day of the term, at which time the regular course of instruction will commence. To provide for cases in which it is absolutely impossible for the candidates to be present at this time, supplementary examinations will be held at such times as may be determined upon by the Faculty, but no excuse, except of an urgent character, will be accepted for failure to appear at the first examination. Certificates for attendance are given for the actual period of attendance only.

Before admission to examination every student is required to present to the Dean of the Faculty the Steward's receipt for the payment of the matriculation fees and annual dues. It will therefore be necessary for the candidate to apply first to the Steward at his office in the University Hall, register his name as a student in the Department of Medicine and Surgery, and pay his fees. In case of rejection, the moneys paid preliminary to examination will be refunded by the Steward.

IV. ADMISSION OF WOMEN.

Recognizing the equality of rights of both sexes to the highest educational advantages, the Board of Regents, a few years since, made provision for the medical education of women, and they are now admitted to this, as to all other departments of the University, on the same conditions that are required of men. It is proper to state, however, in answer to numerous inquiries which are made on this point, that the course of instruction for women, though equal in all respects to that provided for the men, is given separately, the two classes not being together in the lecture rooms except in the department of general chemistry. Ample provision has been made for the women's classes in the way of lecture rooms, dissecting rooms, etc.

V. CONDITIONS OF GRADUATION.

Those candidates preparing to graduate at the close of their second course of lectures, must announce their intention at the beginning of that course, in order to receive those repeated examinations necessary to attest their qualifications.

Those proposing to receive the full three years' graded course before presenting themselves for graduation, must announce their intention to the Dean at the time of their matriculation, or whenever they have thus determined, so that they may be classified, and receive proper directions respecting attendance and exercises, and have proper places assigned them at the various lectures they may attend, and that records may be kept of their attendance and progress. They will from time to time receive certificates of attendance, and of their standing on the subjects in which they have been fully examined.

To be admitted to the degree of Doctor of Medicine, all students must present evidence of the possession of a good moral character, of being twenty-one years of age, of having been engaged in the study of Practical Anatomy and Practical Chemistry, and of having pursued the regular study of medicine for the period of three years; but to encourage a higher grade of preliminary acquirements, and in recognition of the value to a candidate of an extended course of scientific and literary studies, an allowance of six months from the term of medical studies is made in favor of graduates of the College of Arts and Sciences in this University and of other respectable literary colleges; and also in acknowledgement of the amount of medical knowledge obtained in a full course of Pharmaceutical study, an allowance of twelve months is made for graduates of the Department of Pharmacy in this University.

VI. FACILITIES FOR INSTRUCTION.

The Department of Medicine and Surgery is abundantly supplied with plates, photographs, models, specimens, preparations, apparatus and instruments, for the purpose of illustrating the different studies embraced in the course. The apparatus in the Department of Chemistry and of Chemical Physics, is probably unsurpassed, if indeed it be equalled, by that of any medical college in the country. Additions are made from time to time to these collections by special appropriations by the Board of Regents, so that the Faculty are enabled to adopt every new method of illustration, and to exhibit to the classes each year all important improvements in the way of instruments and apparatus that are employed in the practice of medicine and surgery, and to show their application.

The museums of Professors Ford and Sager, embracing several thousand specimens, which are the result of many years' labor in the collection and preparation of materials intended to aid directly in teaching, have now become the property of the University, and are used in the daily work of the class-rooms. These museums contain a valuable collection of bones, illustrating healthy as well as diseased conditions, and showing the various changes that occur from infancy to old age, and the processes of first and second dentition; dissections, general and partial, of the vascular, nervous and muscular systems, both normal and abnormal; models in wax, papier mache, and plaster, of various portions of the body, illustrating morbid growth, skin diseases, etc.; preparations in the comparative embryology, neurology and craniology of the vertebrata; human embryology and anatomy and pathology of the diseases of women, etc. The collection of monstrosities, both single and double, of man and the lower animals is unusually full and valuable.

The department of the museum illustrative of Materia Medica, consists of a very complete suite of crude organic medicinal substances, embracing between five and six hundred specimens imported from Paris, put up in beautiful glass-covered half-gallon jars of uniform appearance, finely displayed and arranged according to their order in natural history; besides about one thousand other specimens of simple mineral and vegetable substances, and pharmaceutical and officinal preparations, active principles, etc., arranged in groups convenient for study. Medicinal botany is further illustrated by between one and two hundred large finely colored plates.

The above collections to which additions are made yearly, are catalogued and arranged in cases. The museum thus affords a secure depository for objects of interest and value, and it is to be hoped that the alumni and other friends of the University will continue their generous donations of such materials.

Besides these aids in study, the students in medicine are allowed free access to the general botanical, zoölogical and geological cabinets of the University, which are estimated to contain 150,000 specimens. The general library contains about 24,500 volumes, of which some 1,700 are medical works. A complete catalogue of the library, arranged both by the names of authors and by subjects, is accessible to all students. The leading medical periodicals of this country and of Europe are taken and kept on file in the library.

Arrangements have been made by which an ample supply of material for the purposes of practical anatomy has been secured, and special attention is given to this important study. Material for this department can be furnished as abundantly, and at as low rates as at other institutions of the kind.

By action of the Faculty of the College of Medicine and Surgery, two extended optional courses have been established, one in Physiological and Pathological Chemistry, and another in Toxicology. The first will embrace a complete analysis of the Blood, Urine, Gastric Juice, Brain, Bile, Bone, Muscles, and other fluids and solids of the body. The second will embrace an extended general course of Qualitative and. Quantitative Analysis, the special examination of foods and of the tissues and fluids of poisoned animals, for the detection of the various mineral and organic poisons.

Neither of these extended courses will be required for graduation. They are designed for those who make a speciality of such work, and neither will require a longer time of laboratory attendance than one collegiate year.

Those who attend either of these courses, and who pass a satisfactory examination upon the subjects at the conclusion, will receive a certificate for the same.

For further details of Laboratory advantages and work, see pp. 77-83.

By a recent act of the Legislature of Michigan, a liberal appropriation for the equipment and conducting of a Physiological Laboratory has been made; and a stereopticon, sphygmograph, and numerous other instruments for extended practical work have been procured, and are in daily use. By the coöperation of the Professors of Anatomy, Physiology, and Pathology, and under proper, efficient direction, and with ample assistance, the students in the College of Medicine and Surgery, without additional charge, will have opportunities of practical instruction in Experimental Physiology, in Histology, both physiological and pathological; and this, supplemented by instruction in Pathological Anatomy and Medical Chemistry, is designed to afford facilities to numbers for minute and specific scientific study and research exceedingly rare in this country, the want of which is deeply felt by all advanced medical practitioners.

Junior students will have an opportunity under competent instruction to study Comparative Anatomy and Physiology practically by dissecting various animals, and while becoming familiar with structures and tissues, will also acquire dexterity in the use of instruments preparatory to the more strictly professional manipulations.

Recognizing the importance of combining clinical with didactic instruction, College Clinics have for years past been conducted on Wednesdays and Saturdays during the session, for Medicinal, Surgical, and Ophthalmic patients. These are examined, prescribed for, and when necessary, operated upon before the class; and large numbers, especially of chronic cases, from this and neighboring States, have availed themselves of these privileges.

By the liberality of the last two legislatures of the State of Michigan, aided by the city of Ann Arbor, and under the care of the Board of Regents, a Hospital has been established, and new pavilion buildings have been erected upon the University grounds of sufficient capacity for a large number of patients. It is now thoroughly equipped and well supported, and is in the immediate charge of a competent house surgeon and physician, and an experienced matron. The whole is placed under the direction of the Faculty of the College whose members will regularly attend (each upon such cases as come within his special department) upon the patients, and will give careful clinical instruction in the wards, to the students of the College properly qualified.

The Hospital will be kept open for patients applying from this and other States during the whole year, the only restriction being that no contagious diseases are admitted.

The expense to patients will only be for their board and for unusual appliances—the services of the Faculty being rendered gratuitously.

Under the present re-organization, it is expected patients will be much better accommodated, and clinical instruction will be rendered more systematic and efficient than has hitherto been possible.

VII. FEES AND EXPENSES.

The fees,* which must be paid in advance, are as follows:

MATRICULATION FEE.—Residents of Michigan, $10; non-residents, $25.

ANNUAL DUES.—Residents of Michigan, $20; non-residents, $25.

GRADUATION FEE.—For all alike, $10.

The admission fee is paid but once, and entitles the student to the privileges of permanent membership in any department of the University. The annual tax is paid the first year, and every year thereafter.. For other details of expenses see pp. 23-24.

VIII. TEXT AND REFERENCE BOOKS.

Either of the following text-books in each department will answer the necessities of the student; and wherever a preference exists, it is given to those first in order on the list.

ANATOMY.—Gray, Wilson, Leidy, Peaslee, Stricker.

PHYSIOLOGY.—Küss, Kirkes, Dalton, Marshall. *For Reference*—Flint, Carpenter, Todd and Bowman, Sanderson's Hand-book for the Physiological Laboratory.

CHEMISTRY AND PHARMACY.—Miller's Chemical Physics, Bloxam's Chemistry, Miller's Inorganic, Douglas and Prescott's Analysis, Harley on the Urine, Wormley's Micro-chemistry of poisons.

MATERIA MEDICA AND THERAPEUTICS.—H. C. Wood, Jr., Stille, Waring, Ringer, Biddle. *Special Subjects*—Headland on the Action of Medicines, Anstie on Stimulants and Narcotics, Harley on the Old Vegetable Neurotics.

PATHOLOGY AND PATHOLOGICAL ANATOMY.—Wagner, Green, Rindfleisch, Billroth, Paget, Williams's Principles. *For Reference*—Rokitansky and Virchow.

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* No portion of the fees can be refunded to students who leave the University during the academic year, except by order of the Board of Regents.

OBSTETRICS.- Playfair, Meadows, Leishman, Tyler Smith, Byford, Schrœder, Cazeaux, Hodge. *Special Subjects*—Tanner on Pregnancy, Barnes on Obstetric Operations, Elliott's Obstetric Clinic, Barker on Puerperal Diseases.

DISEASES OF WOMEN.—Thomas, Byford, Hewitt, West, Barnes, Hodge. *Special Subjects*—Tilt on Uterine Therapeutics: Klob on Pathological Anatomy of the Female Sexual Organs; Peaslee on Ovariotomy; Sims on Uterine Surgery; Emmet on Vesico-Vaginal Fistula.

DISEASES OF CHILDREN.—J. L. Smith, Vogel, Tanner, Meigs, and Pepper. *Special Subjects*—Eustace Smith on the Wasting Diseases of Infancy and Childhood, Comb on the Management of Infancy, Routh on Infant Feeding, Holmes or Guersant on the Surgical Diseases of Children.

PRACTICE OF MEDICINE.—Aitkin, Edited by Clymer, Niemeyer, Roberts, Flint, Watson, Tanner, Wood. *Special Subjects.*—Walshe or Flint on the Lungs, Williams on Pulmonary Consumption, Flint or Stokes on the Heart, Roberts or Beale on Urinary Diseases, Budd on the Stomach, Chambers on Indigestion, Murchison on the Liver, Da Costa on Medical Diagnosis, Loomis on Physical Diagnosis. *For Reference.*—Reynold's System of Medicine, Trousseau's Clinical Lectures, Ziemssen's Cyclopedia.

SURGERY.—Syme, edited by Maclean, Erichsen, Hamilton, Druitt, *Special Subjects*—Billroth on Surgical Pathology, Hamilton on Fractures and Dislocations, Bumstead on Venereal Diseases, Sayre on Club Foot, Sir Henry Thompson or Gouley on Genito-Urinary Organs, C. Henri Leonard on Bandaging. *In Minor Surgery and Surgical Appliances*—Bell, Le Gros Clarke, Anandale, Wales, Sargent. *For Reference*—Gross's System of Surgery and Holmes's System of Surgery.

OPHTHALMOLOGY AND OTOLOGY.—*On the Eye.*—Sœlberg, Wells, Stellwag, Metz, Brown on the Ophthalmoscope. *On the Ear.*—Roosa or Toynbee with Hinton's Supplement, Burnett's Treatise on the Ear.

The student who is commencing a course of reading without an instructor, is recommended to devote the most of his time for the first year to the elementary branches, Anatomy, Physiology, and Chemistry, both general and Medical; then advancing to the other studies to select one of the first mentioned text-books in each department, passing to the "*special subjects*" only when near the completion of the course, or as he may desire for particular reasons to become more fully informed on such subjects. The books mentioned are standard authorities, and will form a good nucleus for a medical library.

IX. ASSIGNMENT OF SEATS.

Students on arriving in Ann Arbor can obtain necessary information in regard to rooms, board. etc., by calling at the Steward's office. Seats in the lecture-rooms are assigned by selection to students in the order of registration on the Steward's books, and according to the class they are to enter; and each student is expected to occupy during the session such seat as may be assigned to him. In the advanced lectures the graduating class, by courtesy, are allowed the privilege of the seats nearest the operating table and lecture desk.

Letters of inquiry may be addressed to the "Dean of the Medical Faculty," Ann Arbor, Michigan.

By comparing the present announcement with those of former years, it will be seen that very great advancements have been made in the means offered for a complete and thorough medical education. The plan of nine months' sessions and three years' graded course in medical schools in this country, inaugurated by Harvard College, has been in part followed by the venerable University of Pennsylvania; and it is a cause of congratulation that this extension of the course in the University of Michigan, long since recommended by the Faculty, and more recently by the Alumni of this College and others of the medical profession of the State, has at length been accomplished. The great importance of this movement must be evident to all who appreciate the vast extension of medical science, which has occurred since medical schools were established among us with four months' terms, or who compare the short courses prevalent in this country with those so much longer in Europe. The great fault with many American medical students is a desire to rush speedily over their course of study and enter, though but partially prepared, into the responsible duties of active practice. It is hoped, however, that there are already many, and that this number will increase, who desire more thorough and extended preparation, and that when by the liberality of a State the means are put within their reach, there will be found not a few who have talent, energy, perseverance and high aims, that will avail themselves of the advantages offered. The increase of numbers since the term has been extended has demonstrated the appreciation of the improvements made.

In the plan of the extended course provided, and which we are sure will be for the interest of every medical student to take, the attempt has been made so to combine a successive or graded course of study with reviews by repetition of the more important lectures, as to obviate the serious objection of dismissing one part of a connected subject before its relations to other parts can be seen and appreciated, and to avoid also the confusion incident to the presentation of so many parts of the general subject to the mind of the student at the same time and at an early period of his studies.

This extended course will afford time for the teaching and study of subjects not generally, or but very imperfectly taught in our medical schools—such as Ophthalmology, Dermatology, Diseases ef the Mind, Preventive Medicine, Medical Jurisprudence, Pathological Anatomy, etc., and especially will it give more time for thorough work in the Laboratories now provided. Though not fully supplying the defects of preliminary education, this longer course, accompanied with repeated examinations and written exercises, will supplement such earlier training as may have been enjoyed, and of itself will be a most efficient means of mental discipline, and of literary as well as scientific culture.

This plan which has been adopted with the view of avoiding the impracticable and of securing real and decided advancement, is presented in the hope that it wiil commend itself to the judgment and support of the profession. Upon the members of the profession who have encouraged such advancements by repeated recommendations, the schools making such advancements should be able to depend for more substantial encouragement than mere advice. Should physicians while professing a desire for reform, send the students whom they control to schools where diplomas are soonest and most easily obtained, the cause of advanced medical education must suffer. Upon their consistency and practical efforts for reform· the success of these experiments must depend.

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Department of Law.

I. DEPARTMENT OF LAW.

In this department it has been the endeavor, alike of the Regents and of the Faculty, to make the instruction imparted and the advantages afforded equal to any attainable elsewhere in the country; and in this they believe they have been entirely successful. They intend to spare no effort on their part to render it deserving in the future of the prosperity it has hitherto enjoyed. A spacious building has been erected for its accommodation, with ample debating and society rooms, and in every respect the conveniences of the department are unsurpassed.

II. TERMS OF ADMISSION.

The requisites for admission are, that the candidate shall be eighteen years of age, and be furnished with a certificate giving satisfactory evidence of good moral character. No previous course of reading is required, but it is expected that all students will be well grounded in at least a good English education, and capable of making use of the English language with accuracy and propriety. The course of instruction for the two terms has been carefully arranged, with a view to enable students to enter profitably at any stage of their studies, and at either term, and it is not important to their course here at which term they enter.

III. COURSE OF INSTRUCTION.

The design of the department is to give a course of instruction that shall fit students for practice in any part of the country. The course will embrace the several branches of Constitutional, International, Maritime, Commercial and Criminal

Law, Medical Jurisprudence, and the Jurisprudence of the United States; and will include such instruction in Common Law and Equity Pleading, Evidence and Practice, as will lay a substantial foundation for practice in all departments of law.

The course will be continued through a period of two years, with one term in each year, commencing this year on the first day of October, and continuing until the Law Commencement in the last week of March ensuing. Ten lectures and examinations will be held each week during the term. For one year they embrace the following subjects:

The Origin and History of Equity Jurisprudence.

The General Heads of Equity Procedure and Nature and Forms of Equitable Remedies.

Criminal Law, and Medical Questions bearing on it;

The Laws of Evidence, and their application to Legal Proceeding;

Contracts;

Title to personal Property by Gift, Inheritance, Sale, Mortgage, Assignment, and by Operation of Law;

Bills of Exchange and Promissory Notes, and Commercial Law generally;

Estates in Real Property; Easements;

Title to Real Property; Domestic Relations.

For the year after the following subjects:

Some Special Heads of Evidence, and Equity Jurisprudence;

Equity Pleadings and Practice; Jurisprudence of the United States;

Shipping and Admiralty; Bailments;

Agency; the Law of Corporations; Common Law Pleading and Practice; Constitutional Law; Partnership; Uses and Trust; Wills, their Execution, Revocation, and Construction.

The Administration and Distribution of Estates of Deceased Persons.

Moot Courts are held at least once a week during the term, for the argument of cases previously given out by the Professors by students designated to discuss them. They will be presided over by the Professor lecturing for the day, who, at the conclusion will review the arguments and give his decision upon the points involved. Club Courts will also be organized among the students, to be arranged and conducted by themselves, with such assistance from the Members of the Faculty as may be desired. These Courts, thus far, have been found alike interesting and useful to those who have participated in them.

IV. LIBRARY.

A well selected and very useful Law Library is open for consultation by students at all reasonable hours. The rooms of the Professors adjoin the Library, and they will be ready at all times to furnish to students such aid in their studies and investigations as they may desire. The General Library of the University is also at all times open to the students of this department. The Law Library has been considerably increased within a few years by a donation, by the Hon. RICHARD FLETCHER, late one of the Justices of the Supreme Court of Massachusetts, of a considerable portion of his own library of law books.

V. DEGREES.

The Degree of Bachelor of Laws will be conferred upon such students as shall pursue the full course of two years in this department, and pass an approved examination. It will also be conferred upon those who, having attended another Law School for a period equal to one year of our course, or practised law for one term under a license from the highest court of general jurisdiction in any State, shall also pursue one year's course in this department, and pass a like examination. In Michigan, the degree entitles the resident graduate to an immediate license to practise in all the courts of the State.

VI. BOOKS.

While several copies of each of the leading text-books will be found in the Library, it is exceedingly desirable that students should supply themselves with such as they may need at their rooms. The Professors will lend them aid in making proper selections, and no loss will be incurred, as the books will be found essential in subsequent practice. Students will find that it will greatly facilitate their studies to have them at hand at all times.

VIII. GENERAL REMARKS.

The Faculty are frequently applied to by letter for advice upon the question of whether it is desirable to enter upon the study of law, and acquire some general knowledge of the principles, before admission to the department. It is somewhat difficult to lay down general rules that can be advantageously applied in all cases, but the Faculty are of the opinion that, for the first year, at least, more positive benefit is received from the lectures, and more positive advancement in the law made, by students who have read before coming, at least the Commentaries of Blackstone, than by those who are beginners here. But the Faculty are aware of the difficulty experienced by the student in giving proper direction to his reading and investigation at the beginning; and they do not therefore make it a condition of admission that there shall be any prior reading in law whatever. The want of such prior reading will, doubtless, in many cases, be fully compensated in the aid the beginner may receive here in the outset. It is not often that the student receives the needed assistance except in law schools. The active practitioner engrossed with the cares of business, cannot—or at least, as proved by experience, does not—furnish the students who place themselves in his charge, the attention and assistance essential to give a correct direction to their reading, and to teach them to apply it usefully and aptly in their subsequent professional life. The reading of a student in a law office is practically the study of the law by himself, and without assistance; and he neither acquires that familiarity with books, and that facility of reference which it will be the aim of this department to assist in acquiring, nor learns anything of the practical application of legal principles, beyond what he may pick up from observation of the practice of his preceptor. The effort here will be to make not *theoretical* merely, but *practical* lawyers; not to teach principles merely, but how to apply them. To this end, the Moot Court will be made the forum for the discussion of such practical questions as must frequently arise in a professional career at the bar; and the attention of the Faculty will be directed not less to the application of the points discussed to actual cases, than to the elucidation of the legal questions. An opportunity will be afforded all the senior students to participate in this court, and they will at all times have such assistance in their Club Courts as they find themselves in need of.

While thus endeavoring to impart legal knowledge, the fact will not be lost sight of, that a high moral standard is a most important requisite to a successful and honorable career; and no pains will be spared in impressing this fact upon students, and in inculcating a high tone of professional ethics and action.

Those who desire any further information concerning the Law Department, may make their inquiries of Hon. T. M. COOLEY, Dean of the Law Faculty.

THE FACULTY

OF

The Department of Law.

JAMES B. ANGELL, LL. D.,
PRESIDENT.
JAMES V. CAMPBELL, LL. D.,
THOMAS M. COOLEY, LL. D.,
DEAN.
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STUDENTS.

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Warren Ashley,	*San Francisco, Cal.*
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Shannon Buntin Hubbard,	*Sandusky, O.*
Martin Hugg,	*Indianapolis, Ind.*
David William Hurn,	*Union Grove, Wis.*
Daniel Carpenter Hyde,	*Stafford, Vt.*
Sylvester B. Isenhart,	*Coldwater.*
Arthur Hancock Ingraham, B. A., Yale College.	*Brooklyn, N. Y.*
Jay J. Jennings,	*Norwalk, Ohio.*
Charles Morrison Johnson,	*Morrison, Ill.*
Lyman R. Jones,	*College Grove, Minn.*
Asa Giles Judd,	*Dixon, Ill.*
Charles Young Kay, M. A., Mt. Union College.	*Alliance, O.*
Edward Kelley,	*Grand Rapids.*
John J. Kerr, B. S., Michigan Agricultural College.	*Eagle.*
Winfield Scott Kerr,	*Lucas, O.*
John Morris Kinnaird, B. A., University of Virginia.	*Lexington, Ky.*
Dana Spalding Lander,	*Beaver Dam, Wis.*
Gustav Adolph Laubscher,	*Cleveland, O.*
James Law,	*Madelia, Minn.*
William Spencer Lee,	*Carlisle, Pa.*
Henry Rudisel Lennaird,	*New Castle, Ind.*
Michael J. Lehmann,	*Waterloo, Ind.*
Elbridge E. Lewis,	*Beaver Dam, Wis.*
Charles Christopher Lockwood,	*Ann Arbor.*
Robert Atwood Long,	*Carrollton, O.*
Frank Wilson Loomis,	*Tuscola.*
Austin Lynch,	*Canton, O.*
John E. Magers,	*Gervais, Oregon.*
John Alexander Mansfield,	*Hopedale, O.*
Edward Carter Manter,	*Elyria, O.*
John McDevitt,	*Hamburg.*
Henry McGrew,	*Wyandotte, Kan.*
William B. McGrorty,	*St. Paul, Minn.*

NAME.	RESIDENCE.
Frank Thompkins McHenry,	*Lima, O.*
George McKay,	*Mayville.*
David C. McLaughlin,	*Muskegon.*
Joseph Rogers McLaughlin, B. S.,	*Birmingham.*
Robert C. McNamar,	*New Enterprise, Pa.*
Jos. Fletcher McNaught, B. S., Illinois Wesleyan University.	*Lexington, Ill.*
Henri Melber,	*Adrian.*
Charles Robert Middleton,	*Afton, Minn.*
Lee Knowlton Mihills,	*Oakland, Cal.*
Charles Jay Monroe,	*South Haven.*
Fritz Morris,	*New York, N. Y.,*
James W. Moulton, B. S., Dartmouth College.	*Berwick, Me.*
William P. Myers,	*Kingston, Pa.*
Henry Wirt Newkirk,	*Dexter.*
Alphonzo Cæsar Norton,	*Cornell, Ill.*
Josiah J. Nunn,	*Norwalk, O.*
Emil Nusbaumer,	*Sunol, Cal.*
William Harrison Ogborn,	*Richmond, Ind.*
George Merritt Orr,	*Wilkesbarre, Pa.*
Charles Calvin Orth,	*Keithsburg, Ill.*
Arthur Porter Peterson,	*Honolulu, H. I.*
Ralph Phelps, Jr.,	*Detroit.*
Peter Phillippi,	*Alma, Wis.*
John Milton Prewett,	*Forest City, Ark.*
Edward Hitchcock Ranney, B. A.,	*Kalamazoo.*
Stephen Marion Reynolds, B. A., Lafayette College.	*Scranton, Pa.*
Thomas Barton Rhodes,	*Lovington, Ill.*
John Evans Richards, B. A., University of the Pacific.	*San Jose, Cal.*
John Alden Riner,	*Greene, Iowa.*
Henry Fillmore Rizer,	*Eureka, Kan.*
James Thompson Robison,	*Cleveland, O.*
Clayton Brown Rockhill,	*Springfield, O.*
Alison Crestus Roe,	*Buchanan.*
Charles Henry Rose,	*Caro.*
Cyrus Egbert Rosenkrans,	*Wayland, N. Y.*
George Frank Ross,	*St. Charles, Ill.*
Winfield Scott Rowley,	*Fredericktown, O.*
Albert Conrad Runkel,	*Milwaukee, Wis.*

NAME.	RESIDENCE.
Henry Wayne Russell,	*Monroe.*
David A. Sawdey, Ph. B.,	*Albion, Pa.*
Louis Charles Schwerdtfeger,	*Jersey City, N. J.*
John Granville Scouten, B. E., Pennsylvania State Normal School.	*Traverse City.*
Allan Hale Sexton,	*Cleveland, O.*
John Chrysostom Sheridan,	*Paola, Kan.*
Preston Fremont Simonds,	*Alexandria, N. H.*
Thomas Shreve Boyce Slaughter,	*Lexington, Mo.*
John C. Slayback, B. A., Ohio National Normal College.	*Bethany, O.*
Adolph Sloman,	*Detroit.*
Clarence Whittier Smith,	*Ann Arbor.*
Frederick Eustace Smith,	*Saginaw.*
Silas Macy Smith,	*Williamsport, Pa.*
Charles Elliot Solis,	*Black Hills, D. T.*
George Washington Somerville,	*Rochester, Minn.*
Louis Hudson Stafford,	*Harvard Junct'n, Ill.*
Levi Starbuck, B. S., Earlham College.	*Bridgeport, Ind.*
Joseph S. Steele,	*Zilwaukee.*
Edwin Forrest Steers,	*Wayne.*
Edward Ives Stimpson,	*Detroit.*
Elias Cephas Stone, B. A., Dartmouth College.	*Greensboro, Pa.*
Milville Stone,	*Unity, Me.*
Elmer T. Swope,	*Greenfield, Ind.*
James King Taylor,	*San Francisco, Cal.*
Otis D. Thompson,	*Elkhart, Ind.*
Charles Manford Thompson, B. A., National Normal College.	*Pisgah, O.*
William Henry Townsend, M. A.,	*Battle Creek.*
William S. Turner,	*Washington, Ind.*
Edwin Smith Van Deusen,	*Sprout Brook, N. Y.*
George Allen Van Dyke,	*Ashmore, Ill.*
John Veeder, B. A., Union College.	*Schenectady, N. Y.*
Benjamin Franklin Wade,	*Cleveland, O.*
Napoleon Wagner,	*Signey, O.*
Edward R. Walbridge,	*St. Johns.*
George Brinton Walker, U. S. A., West Point Military Academy.	*Evansville, Ind.*
Charles Alfred Waltmire,	*Tremont, Ill.*

NAME.	RESIDENCE.
Henry G. Wanty,	*Ann Arbor.*
Isaac Benjamin English Ward,	*San Jose, Cal.*
Delos N. Weaver,	*Elkhart, Ind.*
Lovell H. Webb,	*Topeka, Kan.*
Walter Webster,	*Assyria.*
William Arnold Weeks, M A., **Lafayette College.**	*Jewett City, Conn.*
Dudley Morris Wells,	*Montgomery.*
Otway Curry Weesner,	*Wabash, Ind.*
Henry E. Weiskopf,	*Milwaukee, Wis.*
Charles Alvah Widener,	*Clifton, N. Y.*
David J. Williams,	*Culloden, Canada.*
Henry Frank Williams,	*Jackson.*
William Henry Harrison Williamson, B. S., **National Normal College.**	*Union City, Ind.*
Louis Barney Winsor, B. S., **Hillsdale College.**	*Hillsdale.*
Martin Van Buren Wixon,	*Fenton.*
Thomas Jefferson Wolff,	*Sheboygan, Wis.*
Emery Thomas Wood,	*Rockwood.*
Daniel Audubon Wood,	*Niles.*
Cyrus Woodbury,	*Union City, Ind.*
Henry Madison Woodford, B. A., **Kentucky University.**	*Paris, Ky.*
William Robert Wooden,	*Tecumseh.*
George W. Wurzell,	*Pittsburg, Pa.*
John Otto Zabel,	*Petersburg.*
Augustus Herman F. Zeigler,	*Selin's Grove, Pa.*

THE
Homœopathic Medical College.

I. THE LECTURE COURSE.

The provision of the Legislature has enabled the Board of Regents to meet the growing demand for a more advanced medical education by extending the course of teaching from six to nine months in each year, and by enlarging the curriculum. Henceforth the session includes the entire University year, extending from October first to July first.

Students who matriculated before the session of 1877-8 will be allowed to complete their course according to the plan of teaching in force when they entered, and such of them as may desire so to do, can present themselves for graduation at the end of the first six months of the session. All are, however, advised to complete the nine months' course—the last three of which will embrace subjects not touched upon in the first six months.

In addition to this extension of the term, a graded course, to include three years' study will be provided. The *first* year of this course will include Anatomy, Histology, Physiology, Chemistry, and Materia Medica, with the necessary practical work in the Chemical and Physiological Laboratories. This years' Materia Medica work will be devoted to teaching the source, nature, origin and method of preparing remedies, with their physiological action and a general survey of their pathogenesis.

In the *second* year the above studies will be reviewed, and the student will take up Pathology, Pathological Anatomy, Chemistry in its application to Physiology and Pathology, and

Hygiene, or Preventive Medicine. The Materia Medica work of this year will consist of special analyses and syntheses of drug-provings. In addition the student will attend such didactic and clinical lectures on the Practical Branches as his progress shall render advisable.

At the end of the *second* year, *final examinations* will be held in Anatomy, Histology, Chemistry, and Preventive Medicine.

In the *third* year, Pathology and Pathological Anatomy will be reviewed, and the student will enter upon Ophthalmology, Obstetrics, Diseases of Women and Children, Surgery, and the Theory and Practice of Medicine, with practical instruction in Diagnosis and Treatment.

In this course Therapeutics and experimental Pathogenesy will be taught—the latter with all the aids of the Chemical and Physiological Laboratories. Every opportunity will be given to those desiring to make original investigations in drug action.

This course is for the present elective, but after the session of 1878-9, no student shall be recommended for the degree of Doctor of Medicine who has not passed a thorough and satisfactory examination on all the subjects taught in the extended course, and who has not been in regular attendance upon Medical Lectures in this or some other respectable school of Medicine for at least two full courses, the last of which must have been in this College; and after the session of 1878-9 graduation will occur only at the June Commencement.

The final examination of all future matriculants will be conducted, in part at least, in writing; and during the last session each candidate for graduation will be required to submit to written examinations, and may be called upon to write upon some theme assigned by the instructor or selected by the student: the essay, if required, to be defended before the class. In consequence of these exercises a final Thesis will not be required.

Properly qualified students may enter the College at any time, and pursue such of the studies therein taught as they may select, and they shall receive special certificates for the time spent and the study or studies pursued. By recent action of the Regents special rates have been established for the benefit of such students. For practical Laboratory work this arrangement affords an opportunity, of which it is believed many will be glad to avail themselves, and the advantages are second to none in America.

In accordance with these arrangements, the fourth annual course of lectures will commence on Tuesday, October 1, 1878, and continue until the last Wednesday of June, 1879, with a recess during the holidays.

Four lectures will be delivered daily; and during the course frequent examinations will take place upon the subjects presented in the lectures. Clinics are held in the College every Wednesday and Saturday, for both medical and surgical cases, at which time medical examinations are made, prescriptions given, and surgical operations performed, gratuitously to patients, in the presence of the class.

II. TERMS OF ADMISSION.

Every candidate for admission to this college must be eighteen years of age, and must present to the Dean satisfactory evidence of good moral character. Unless already a matriculant of the University or a graduate of some respectable college, academy or high school, every candidate shall be examined as to his previous education and his fitness to enter upon and appreciate the technical study of medicine. The diploma or certificate of graduation from such institutions must be presented to the Dean of the Faculty by the candidate in order to secure exemption from the examination, which will be in writing, and will cover the ordinary branches of an English education. This examination is not yet so exacting in its demands as we hope to be able to make it before long, but it is intended to test the student's acquaintance with the fundamental branches of an English education, and his general intelligence and capacity to appreciate and profit by professional instruction.

Examinations will be held at 2 P. M. on Saturday and Monday, September 28 and 30, 1878. Candidates are required to present themselves on one of those days, as they are expected to be in attendance upon the first day of the term, at which time the regular course of instruction will commence. To provide for cases in which it is absolutely impossible for candidates to be present at this time, supplementary examinations will be held at such times as may be determined upon by the Faculty, but no excuse, except of an urgent character, will be accepted for failure to appear at the first examination. Certificates of attendance are given for the actual period of attendance only.

Before admission to examination every student is required to present to the Dean of the Faculty the Steward's receipt for the payment of the matriculation fees and annual dues. It will therefore be necessary for the candidates to apply first to the Steward at his office in University Hall, register his name as a student in the Department of Medicine and Surgery, and pay his fees. In case of rejection, the moneys paid preliminary to examination will be refunded by the Steward.

III. ADMISSION OF WOMEN.

Recognizing the equal rights of both sexes to the highest educational advantages, the Board of Regents, a few years since, made provision for the medical education of women, and they are now admitted to this College, as to all other departments of the University, on the same conditions that are required of men. It is proper to state, however, in answer to numerous inquiries which are made on this point, that the course of instruction for women, though equal in all respects to that provided for the men, is given separately, the two classes not being brought together in the lecture rooms except in the study of general chemistry. Ample provision has been made for the women's classes in the way of lecture rooms, dissecting rooms, etc.

IV. CONDITIONS OF GRADUATION.

Those candidates preparing to graduate at the close of their second course of lectures, must announce their intention at the beginning of that course, in order to receive those repeated examinations necessary to attest their qualifications.

Those proposing to pursue the full three years' graded course before presenting themselves for graduation, must announce their intention to the Dean at the time of their matriculation, or whenever they have thus determined, so that they may be classified, and receive proper directions respecting attendance and exercises, and have proper places assigned them at the various lectures they may attend, and that records may be kept of their attendance and progress. They will from time to time receive certificates of attendance, and of their standing in the subjects in which they have been fully examined.

To be admitted to the degree of Doctor of Medicine, all students must present evidence of the possession of a good moral character, of being twenty-one years of age, of having been engaged in the study of Practical Anatomy and Practical Chemistry, and of having pursued the regular study of medicine for the period of three years; but to encourage a higher grade of preliminary acquirements, and in recognition of the value to a candidate of an extended course of scientific and literary studies, an allowance of six months from the term of medical studies is made in favor of graduates of the College of Arts and Sciences in this University and of other respectable literary colleges; and also in acknowledgement of the amount of medical knowledge obtained in a full course of Pharmaceutical study, an allowance of twelve months is made for graduates of the Department of Pharmacy in this University.

V. FACILITIES FOR INSTRUCTION.

Students in this College will receive instruction in Materia Medica, Therapeutics, and Experimental Pathogenesy; in Theory and Practice, and Clinical Medicine; in Surgery, Obstetrical and Gynæcological Therapeutics. For all other studies the students will attend the lectures in the Department of Medicine and Surgery, and the lectures and demonstrations in the Chemical and Physiological Laboratories. While in attendance upon such lectures and demonstrations they shall be entitled to all the privileges accorded to students in said Department, and shall conform to all requirements of said Department, so far as they apply to the branches which they pursue.

Liberal provision is made by the Board of Regents for illustrating the various branches of instruction by plates, preparations, specimens and apparatus. The department of chemistry and chemical physics is probably unsurpassed, if indeed it is equalled, in the extent and thoroughness of its equipments, by that of any medical college in the country. The museums, containing several thousand specimens, comprise a valuable collection of bones, amply illustrating both physiological and pathological conditions, of all ages, and showing the processes of dentition, of growth, and of decay in the osseous system, dried preparations, normal and abnormal, of the different tissues of the body, embracing muscles, blood vessels, nerves, etc.; models and casts illustrating skin diseases, tumors, and pathological changes in the various organs. In the sections devoted to comparative embryology and craniology, and in human embryology and the diseases of women, the collections are especially interesting. The specimens of monstrosities, both single and double, of man and the lower animals, are very numerous and instructive.

Besides these aids in study, the students in medicine are allowed free access to the general botanical, zoölogical and geological cabinets of the University, which are estimated to contain 150,000 specimens. The scientific and philosophical lectures collateral to medicine, which are given in the Collegiate Department are also open to our students. The general library contains about 24,500 volumes, of which some 1,700 are medical works. A complete catalogue of the library, arranged both by the names of authors and by subjects, is accessible to all students. The leading medical periodicals of this country and of Europe are taken and kept on file in the library.

Arrangements have been made by which an ample supply of material for the purposes of practical anatomy has been secured, and special attention is given to this important study. Material for this department can be furnished as abundantly, and at as low rates as at other institutions of the kind.

By a recent act of the Legislature of Michigan, a liberal appropriation for the equipment and conducting of a Physiological Laboratory has been made, and the Board of Regents have directed the purchase of a large number of new microscopes and other instruments for extended practical work. By the coöperation of the Professors of Anatomy, Physiology, and Pathology, and under proper, efficient direction, and with ample assistance, the students in the College of Medicine and Surgery, without additional charge, will have opportunities of practical instruction in Experimental Physiology, in Histology, both' physiological and pathological; and this, supplemented by instruction in Pathological Anatomy and Medical Chemistry, is designed to afford facilities to numbers for minute and specific scientific study and research exceedingly rare in this country, the want of which is deeply felt by all advanced medical practitioners.

Two extended optional practical courses have been established one in Physiological and Pathological Chemistry, and another in Toxicology. The first will embrace a complete analysis of the Blood, Urine, Gastric Juice, Brain, Bile, Bone, Muscles, and other fluids and solids of the body. The second will embrace an extended general course of Qualitative and Quantitative Analysis, the special examination of foods and of the tissues and fluids of poisoned animals, for the detection of the various mineral and organic poisons.

Neither of these extended courses will be required for graduation. They are designed for those who make a speciality of such work, and neither will require a longer time of 'Laboratory attendance than one collegiate year.

Those who attend either of these courses, and who pass a satisfactory examination upon the subjects at the conclusion, will receive a certificate for the same.

For further details of Laboratory advantages and work, see pp. 77-83.

Recognizing the importance of combining clinical with didactic instruction, College Clinics will be conducted on Wednesdays and Saturdays during the session, for Medical, Surgical and Ophthalmic patients. These are examined, prescribed for, and when necessary, operated upon before the class; and large numbers, especially of chronic cases, from this and neighboring States, have availed themselves of these privileges.

By the liberality of the last two legislatures of the State of Michigan, aided by the city of Ann Arbor, and under the care of the Board of Regents, a Hospital has been established, and new pavilion buildings have been erected upon the University grounds of sufficient capacity for a large number of patients. Provisions are now made for its thorough equipment and support, and for its being in the immediate charge of a competent house surgeon and physician and an experienced matron. A portion is placed under the Faculty of this College, whose members will regularly attend (each upon such cases as come within his special department) upon the patients, and give careful clinical instruction in the wards, to all medical students.

The Hospital will be kept open for patients applying from this and other States during the whole year, the only restriction being that no contagious diseases are admitted.

The expense to patients will be only for their board and for unusual appliances—the services of the Faculty being rendered gratuitously.

Under the present re-organization, it is expected patients will be much better accommodated, and clinical instruction will be rendered more systematic and efficient than has hitherto been possible.

VI. FEES AND EXPENSES.

The fees,* which must be paid in advance, are as follows:

MATRICULATION FEE.—Residents of Michigan, $10; non-residents, $25.

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*No portion of the fees can be refunded to students who leave the University during the academic year, except by order of the Board of Regents.

ANNUAL DUES.—Residents of Michigan, $20; non-residents, $25.

GRADUATION FEE.—For all alike, $10.

Graduates of other respectable medical colleges, *and who are not candidates for the degree,* pay simply the annual fee of $10, if residents of Michigan; if non-residents, $25.

The admission fee is paid but once, and entitles the student to the privileges of permanent membership in any department of the University. The annual tax is paid the first year, and every year thereafter.. For other details of expenses see pp. 23-24.

VII. TEXT AND REFERENCE BOOKS.

ANATOMY.—Gray, Wilson. *For Reference.*—Sharpey and Quain.

HISTOLOGY.—Frey, Stricker, Rutherford.

MICROSCOPY.—Beale, Frey.

PHYSIOLOGY.—Flint, Dalton, Foster. *For Reference*—Flint, *larger work;* Carpenter, Todd's Cyclopædia, Todd and Bowman, edited by Beale.

CHEMISTRY.—Barker, Roscoe, Bloxam, Douglas and Prescott's Analysis.

TOXICOLOGY.—Christison, Taylor.

PATHOLOGY.—Wagner (general), Bilroth (surgical), Paget, (surgical), Virchow, *Cellular Pathology.*

PATHOLOGICAL ANATOMY.—Wilks and Moxon, Jones and Sieveking, Rindfleisch. *For Reference.*—Wedl, Hasse, Rokitansky.

MATERIA MEDICA AND THERAPEUTICS.—Hughes's Pharmacodynamics; Herring's Condensed Materia Medica; Hull's Jahr; New Remedies, 2d edition; Hahnemann's Organon, Materia Medica Pura, Chronic Diseases; Allen's Encyclopedia; Hartmann's Homœopathic Remedies. *For Reference*—H. C. Wood, Bartholow, Stillé, Phillips, Ringer, Christison, or Taylor on Poisons; Harley's Old Vegetable Neurotics; Report of the Edinburg Committee on the Action of Mercury on the Biliary Secretion.

N. B.—Phillips and Ringer are especially recommended to such graduates as contemplate studying Homœopathy.

OBSTETRICS.—Guernsey, Leadam, Meadows, Leishman, Tyler, Smith, Byford, Milne, Schrœder, Cazeaux, Hodge. *Special Subjects*—Tanner on Pregnancy, Barnes on Obstetric Operations, Elliott's Obstetric Clinic, Barker on the Puerperal Diseases.

DISEASES OF WOMEN.—Thomas, Byford, Hewitt, West, Barnes Hodge. *Special Subjects.*—Klob on Pathological Anatomy of the Female Sexual Organs; Peaselee on Ovariotomy; Sims on Uterine Surgery; Emmet on Vesico-Vaginal Fistula.

DISEASES OF CHILDREN.—Hartmann, J. L. Smith, Vogel, Tanner, Meigs, Pepper, Hiller. *Special Subjects.*—Eustace Smith on the Wasting Diseases of Infancy and Childhood; Combe on the Management of

Infancy; Routh on Infant Feeding; Holmes or Guersant on the Surgical Diseases of Children.

THEORY AND PRACTICE.—Baehr, Marcy and Hunt, Hughes, Hartmann, Niemeyer, Roberts, Flint. *For Reference.* Aitkin, Reynolds, Trousseau, Graves, Ziemssen's Cyclopedia.

SURGERY.—Franklin, Helmuth, Gilchrist's Surgical Therapeutics, Syme, edited by Maclean, Erichsen, Hamilton, Druitt. *Special Subjects*—Hamilton on Fractures and Dislocations; Bumstead on Venereal Diseases; Sayre on Club Foot; Sir Henry Thompson or Gouley on the Genito-Urinary Diseases and Surgery; Van Buren and Keyes on the Genito-Urinary Organs. *In Minor Surgery and Surgical Appliances*—Bell, Le Gros Clarke, Anandale, Wales, Sargent, C. Henry Leonard on Bandaging. *For Reference*—Gross's System of Surgery; Holmes's System of Surgery.

OPHTHALMOLOGY AND OTOLOGY.—*On the Eye*—Sœlberg Wells, Stellwag, Carter, Metz. *On the Ear*—Roosa or Toynbee with Hinton's Supplement.

URINARY PHYSIOLOGY AND PATHOLOGY.—Harley, Hassall, Beale, Parkes, Thudicum, Neubauer and Vogel.

PHYSIOLOGICAL CHEMISTRY.—Brunton, (Handbook for the Physiological Laboratory), Thudicum (Manual of Chemical Physiology). *For References*—Lehmann's Physiological Chemistry.

The student who is commencing a course of reading without an instructor, is recommended to devote the most of his time for the first year to the elementary branches, Anatomy, Physiology, and Chemistry, both general and medical; then advancing to the other studies to select one of the first mentioned text-books in each department, passing to the "*special subjects*" only when near the completion of the course, or as he may desire to become more fully informed in them.

VIII. ASSIGNMENT OF SEATS.

Students on arriving in Ann Arbor can obtain necessary information in regard to rooms, board, etc., by calling at the Steward's office. Seats in the lecture-rooms are assigned by selection to students in the order of registration on the Steward's books, and according to the class they are to enter; and each student is expected to occupy during the session such seat as may be assigned to him. In the advanced lectures the graduating class, by courtesy, are allowed the privilege of the seats nearest the operating table and lecture desk.

Letters of inquiry may be addressed to the "Dean of the Homœopathic Medical College," Ann Arbor, Michigan.

THE FACULTY

OF THE

Homœopathic Medical College.

JAMES B. ANGELL, LL. D.,
PRESIDENT.

SAMUEL A. JONES, M. D.,
DEAN.

JAMES G. GILCHRIST, M. D.,
CHARLES GATCHELL, M. D.,

GEORGE A. TABER, M. D.,
CHESTER S. HUBBARD, M. D.,
WILLIAM B. KNAPP, M. D.

STUDENTS.

NAME.	RESIDENCE.	PRECEPTOR.
Zobediah Alleman,	*Waterloo, N. Y.,*	J. J. Alleman.
Alvin Byron Allyn,	*Pittsfield,*	C. Grover.
Sylvester Armstrong,	*Ann Arbor,*	Faculty.
Amelia Martha Atkins,	*Bristol, Conn.,*	H. E. Way,
Aaron B. Avery,	*Chelsea,*	G. A. Robertson.
Archibald Herbert Babcock,	*Jamestown, N. Y.,*	C. Ormes & Son.
James Douglas Baker,	*Palo.*	A. L. Macomber.
Reuel Bartlett,	*Midland City,*	Faculty.
V. Crayton Campbell,	*Mehoopany, Pa.,*	F. C. Denison.
Guy Russell Clark,	*Sandy Hill, N. Y.,*	G. W. Little.
Hiram Rufus Clark,	*Twinsburg, O.,*	G. L. Stone.
Sarah J. Coe,	*Monroe,*	A. J. Sawyer.
Isaac N. Coleman,	*Dexter,*	A. H. Rogers.
John Coolidge,	*Wellsboro, Pa.,*	Faculty.
Elijah Nash Cooper,	*Jackson,*	S. P. Town.
Horace Marvin Corey,	*Waverly, N. Y.,*	J. M. Cadmus.
John Henry De May,	*St. Johns.*	A. J. Wiggins.
Clark De Muth,	*Toulon, Ill.,*	T. Backmeister.
Frank B. Deubel,	*Ann Arbor,*	Faculty.
Mary Ann Tanner Dill,	*Ladoga, Ind.,*	J. W. Dill.
Anna E. P. Eastman,	*Ann Arbor,*	Faculty.
Patrick Henry Evans,	*Middleville,*	J. P. Ferguson.
Lottie E. Fitzgerald,	*Detroit,*	Lucy M. Arnold.
William Alvard Franklin, Ph.B. University of Wisconsin.	*Fall River, Wis.,*	E. C. Kanouse.
Phœbe Ann French,	*Jackson,*	H. B. Ball.
Leonard Edwin Gallup,	*Marshall,*	B. A. Gallup.
Ernest Egbert Gatchell,	*Chicago, Ill.,*	Charles Gatchell.
Merritt Eugene Graham,	*Honeoye Falls, N. Y.,*	S. N. Brayton.
George Edmund Gray,	*Batavia, N. Y.,*	J. F. Baker.
Ralph E. Gustin,	*Forest, Ont.,*	Faculty.
Oscar S. Hartson,	*Springport,*	J. B. Judson.
Volney A. Hoard,	*Macedon, N. Y.,*	M. H. Adams.

NAME.	RESIDENCE.	PRECEPTOR.
Edward Everett Hoit,	*Minneapolis, Minn.,*	D. M. Goodwin.
Florence Barbara Holden,	*Greenville, Ill.,*	Faculty.
Thomas Jefferson Jackson,	*Flint,*	Faculty.
William B. Knapp,	*Leslie,*	D. Forbes.
Lavinia D. Lambert,	*New York, N. Y.,*	Faculty.
John Mallory Lee,	*Palo,*	J. A. Baker.
Robert Addison Linendoll,	*Fort Edward, N. Y.,*	G. W. Little.
Albert Lodge,	*Detroit,*	E. A. Lodge.
Edward Augustus Lodge,	*Detroit,*	E. A. Lodge.
John Summerfield Martin,	*Plainwell,*	R. Pengelley.
Daniel A. McLachlan,	*Springfield, Ont.*	Dr. Clark & Bros.
Eliza Mitchell, M. D.,	*Ann Arbor,*	Faculty.
Samuel Stewart Moffatt,	*Alpena,*	A. Wilkinson.
Israel Ohlinger,	*Diamondale,*	W. H. Hoffman.
Charles Osborne Padley,	*Muskegon,*	T. H. Vertney.
William A. Pierce,	*Lansing,*	B. F. Bailey.
Willis Pomeroy Polhemus,	*Marshall,*	E. H. Lathrop.
Elise Jane Ray,	*Findlay, O.,*	A. L. Davis.
Grace Roberts, M. D.,	*Holland Patent, N. Y.*	C. B. Winslow.
Alfred Salls,	*Flint,*	J. G. Malcolm.
Cyrenius Chapin Sayles,	*Lowell,*	Faculty.
Emma Tolbert Schriener,	*Oil Creek, Pa.,*	Faculty.
Charles Sumner Sears,	*Quincy,*	Shepard & Smith.
Wallace James Skinner,	*Le Roy, N. Y.,*	S. W. Skinner.
Mary Jane Spalding,	*Ann Arbor,*	Faculty.
William Hodgson Steel,	*Boonville, Mo.,*	C. S. Burger.
John Wesley Stone,	*Holly,*	W. M. Bailey.
Franklin Russell Timmerman,	*Nashville,*	H. A. Barber.
Charles Morton Waelder,	*Hannibal, Mo.,*	Wm. D. Foster.
Charles Eugene Walker,	*Hornellsville, N. Y.,*	H. C. Orcutt.
Stephen Eugene Warner,	*Flint,*	B. L. Cleveland.
William Watts,	*Farmingdale, Ill.,*	J. A. Vincent.
Ellen Maria Webster,	*Put-in-Bay Isl., O.,*	E. C. Stroud.
Aaron Robert Wheeler,	*York,*	C. Y. Harris.
Joel Sylvanus Wheelock,	*Ann Arbor,*	Dr. Russell.
Kate Henrietta Whipple,	*Mansfield, Pa.,*	Eliza J. Beach.
Frank Newman White,	*Marquette,*	S. D. Humphrey.
Ashley Jay Williams,	*Ann Arbor,*	Faculty.
Amos Hiram Winslow,	*Ann Arbor,*	Faculty.
James Craven Wood,	*Monroe,*	A. J. Sawyer.
Francis M. Wright,	*Farmington, Pa.,*	C. V. Elliot.

College of Dental Surgery.

I. ANNOUNCEMENT.

The fourth annual course of instruction in this Institution will commence on Tuesday, October 1, 1878, and continue till the last Wednesday of March, 1879. There will be a recess of about two weeks during the Holidays, thus making a course of six months.

The term of instruction in the Medical Department continues nine months; the students in the Dental College will therefore have an opportunity to continue their studies, especially in the collateral branches, till the last of June following, and this the Faculty strongly recommend.

There are four lectures daily during the regular course, and examinations are made upon the subjects presented.

The Dental students are required to attend all the lectures in the Medical College, unless excused by express permission.

It is for the interest of all, and especially of the students, that they be in attendance promptly at the beginning of the term. Seats are assigned in the order of matriculation, and the regular course of instruction commences at once.

II. QUALIFICATIONS FOR ADMISSION.

Every candidate for admission must be eighteen years of age, and must present to the Faculty satisfactory evidence of a good moral character. Unless already a matriculant of the University, or a graduate of some respectable college, academy or high school, every candidate shall be examined as to his previous education, and his fitness for entering upon and appreciating the technical study of Medicine. The diploma or certificate of graduation from such institutions must be presented to the Dean of the Faculty by the candidate in order to secure exemption from the examination, which will be in writing, and will embrace the ordinary branches of an English education.

Examinations will be held on Saturday and Monday, September 28 and 30, 1878. Candidates are required to present themselves on one of these days, as they are expected to be in attendance upon the first day of the term, at which time the regular course of instruction will commence. To provide for cases in which it is absolutely impossible for the candidate to be present at this time, supplementary examinations will be held at such times as may be determined by the Faculty. Certificates of attendance are given for the actual period of attendance only.

Before admission to examination every student is required to present to the Dean of the Faculty the Steward's receipt for the payment of the matriculation fees and annual dues. It will therefore be necessary for the candidate to apply first to the Steward at his office in the University Hall, register his name as a student in the Dental College, and pay his fees. In case of rejection, the moneys paid preliminary to examination will be refunded by the Steward.

III. ADVANTAGES OF CONNECTION WITH THE UNIVERSITY.

The Department of Medicine and Surgery, long in successful operation, offers in full the facilities required for the satisfactory study of all branches common to General Medicine and this speciality. These facilities may be concisely enumerated as follows:

I. CHEMISTRY.

Recognising the important part chemical agents play in diseases of the dental apparatus students will attend the lectures on inorganic and organic chemistry, besides which they may enjoy the advantages of the chemical laboratory, for the practical study of all those agents or secretions that concern their future needs in the prevention and cure of disease.

The Laboratory is a building devoted exclusively to chemistry, furnished with all needed apparatus for any kind of research that may be required. For details of chemical work see pp. 78-8 ..

II. MATERIA MEDICA AND THERAPEUTICS.

Under this head will be brought in review all the remedial agents the dentist will need to use, with the fundamental principles which will guide their application in practice.

III. ANATOMY.

The groundwork of our science, the importance of which to the dentist cannot be overestimated, will be studied demonstratively and practically. Besides the full course on anatomy which the student will attend with the medical class, special instruction will be given in the anatomy and histology of all that appertains to the oral apparatus. Thereby the dental student can become thoroughly acquainted with the region of his future professional practice, and in this study he must actively participate to make his knowledge of these parts complete.

IV. PHYSIOLOGY AND HISTOLOGY.

These subjects are fully considered and illustrated in their various aspects, and especially so far as they give light upon pathology. The importance of histological knowledge to the full comprehension of physiology is so fully recognized as to render necessary the establishment of a Histological and Microscopical Laboratory, in which all structures and tissues of the animal body may be studied in detail by the aid of the microscope.

A Physiological and Histological Laboratory has been established which is supplied with a large number of superior microscopes, and all accessory apparatus and appliances requisite for the thorough prosecution of the work.

A course in this Laboratory not only gives the student a knowledge of animal structures and tissues, but makes him familiar with the working and uses of the microscope.

All candidates for graduation are required to take this course.

V. PATHOLOGY AND PRACTICE.

The instruction in Pathology and Practice of Medicine, always thorough and exhaustive in regular medical lecturés, will furnish ample means for becoming acquainted not only with the principles, but with the details of application.

VI. SURGERY.

A complete course in this essential branch will fully meet the dentist's needs in the discussion and presentation of surgical diseases, as well as the great underlying principles of surgical practice wherever applied.

VII. DISEASES OF WOMEN.

Knowing how seriously the conditions of maternity and the provisions therefor often disturb the system, the dental student will be profited by the instruction given in the obstetrical and allied lectures.

In short we consider the advantages which are offered by a fully equipped medical college of the first importance to the student of dental science, and we regard the attendance upon at least one entire course of medical lectures as the proper foundation for the subsequent study of a speciality. The student may here avail himself of all these facilities for a thorough education, in which the needs of a dentist will receive appropriate consideration.

IV. OPERATIVE DENTISTRY.

In this department will be presented the principles involved in the treatment of and operation upon the natural teeth and adjacent parts, for their preservation and restoration to health when diseased. This will embrace not only attention to the various affections of the teeth and contiguous parts, but the character and application of the special remedial agents, and the various approved methods of operating in all the details of condition, materials, instruments and appliances.

The student will be required to make his attainments thorough upon all these particulars, in order that he may never be at a loss for a guide in his treatment and manipulation.

V. CLINICAL.

In this department the aim will be to give the most thorough practical instruction in the operative details, and in the preparation of the instruments and appliances used.

The operating rooms are ample, and well arranged, and fully supplied with all the requisite facilities, such as chairs, engines, etc. All valuable appliances will be made available and instructions in their use given.

Every member of the Senior class, at least, will be required to spend a part of each day in the clinic room.

The opportunity and facilities for clinical instruction and experience are all that could be desired. Applications for treatment and operations have been far in excess of the requirements of the class. A very important consideration in this matter is that nearly all of those applying for services are persons who appreciate and value their teeth, and have been accustomed to receive the attention of skilful operators; in this fact is found a very desirable stimulus to the student, and one highly conducive to good order and decorum in the operating room.

VI. MECHANICAL DENTISTRY.

The instruction in this department will embrace everything that will enable the dentist to meet successfully the requirements in supplying substitutes for lost dental organs.

Special reference will be given to the principles involved in the restoration of voice and natural expression of features.

Practical and valuable modes will be taught, and no time will be wasted upon worthless and obsolete styles.

Those who have Laboratory tools and appliances should bring them; those who have not, are advised to defer purchasing till they arrive at the College, as they will then have the aid of the teachers in making selections.

Special attention will be given to the manipulation and management of the precious metals with reference to their application to dental purposes.

VII. COURSE OF STUDY.

In the arrangement of this course of study it is the aim to make it such as will meet the requirements of the students, and the expectation of the dental profession, and promise the greatest benefit to the public.

It is generally conceded that graded and progressive work promises the best results in education; and in accordance with that view, the following classification of studies has been adopted:

For the Junior Year.—Anatomy, including dissections, Physiology, Elementary Chemistry, Materia Medica, and Mechanical Dentistry. These branches must be studied by means of lectures, text-books and demonstrations. Members of the Junior class are expected to hear the lectures of the Senior course. Upon the branches above indicated the Juniors shall stand an examination at the end of the first term, or prior to entering the Senior class. The character of this examination will determine the admission to the Senior class. Prior to this examination each student shall make and deposit in the College an artificial denture that shall be approved by the teacher in that branch, and also present a satisfactory practical denture made by himself.

The Senior Year—Shall embrace a review of the studies of the Junior year, Histology, Pathology, including Diseases of women and children, Therapeutics, General and Special Surgery, Analytical Chemistry, and Operative Dentistry.

In order to obtain greater proficiency a course of three years, embracing three sessions, is recommended. Such a course would occupy a session between the Junior and Senior years, an intermediate year. For those who take this course some modification of the present arrangement of studies will be made.

VIII. AIDS TO INSTRUCTION.

The College is supplied with a large number of selected models and charts for illustrative teaching. The design is to make every practicable appliance in this direction available.

It is proper to state that, in addition to these, the Museum of the Medical College, so well supplied with all things necessary for the medical student, is already rich in material to aid the dentist, and will be further increased by important additions at no distant day. The museum is constantly used in illustrating lectures, and is always open to students. The University Museum also contains more than 250,000 scientific specimens, and is accessible to all who desire its advantages.

The University Library is open daily offering its advantages with about 1,700 volumes of medical literature to all who desire to use it, and a library of dental science, containing almost every known work on this speciality, is accessible to the students. Those who can command the time may also avail themselves of numerous lectures, or pursue elective studies, limited only by their capacity for appropriating what is abundantly offered.

IX. GRADUATION.

The candidate for graduation must be twenty-one years of age. He must furnish evidence of good moral character. He must have devoted three years to the study of his profession, and have made such attainments in all the branches of the course of study herein indicated as shall be satisfactory to the Faculty. He must attend two full courses of lectures in the Dental College, or one course elsewhere, and the last one here, and we recommend that he attend these courses regularly. He must pursue the study of Chemistry in the Laboratory, or sustain an examination in the studies there pursued. He must submit to the Faculty a thesis upon some subject of his course, or upon some practical case which he shall have brought to a successful termination by his own effort. He must present for inspection practical operations prepared by himself in the College, and give evidence of his skill and ability in treating those derangements which may be submitted to his care. He must sustain an examination satisfactory to the Faculty in all the branches taught.

A graduate of the Medical College may enter the Senior class, and, if found qualified, may graduate, after one year has been devoted exclusively to the study of Dentistry.

X. TEXT-BOOKS.

Operative Dentistry.—Taft's Operative Dentistry, Harris's Principles and Practice of Dental Science, Tomes's Dental Surgery, Harris's Dictionary of Dental Surgery.

MECHANICAL DENTISTRY—Richardson's Mechanical Dentistry.

For books of reference on medical subjects see page 102.

XI. FEES AND EXPENSES.

The fees, which must be paid in advance, are as follows:

MATRICULATION FEE.—Residents of Michigan, $10; non-residents, $25.

ANNUAL DUES.—Residents of Michigan, $20; non-residents $25.

GRADUATION FEE—For all alike, $10.

The admission fee is paid but once, and entitles the student to the privileges of permanent membership in any department of the University. The annual tax is paid the first year, and every year thereafter.

For further details concerning expenses, see pp. 23-24.

STUDENTS.

NAME.	RESIDENCE.	PRECEPTOR.
Fred Stephen Anderson,	*Pittsfield,*	Faculty.
Edwin Earl Arnold,	*Lapeer,*	E. G. Douglas.
Uriah Dildine Billmeyer,	*Tecumseh,*	Faculty.
David M. Cattell,	*Cadiz, O.,*	H. H. Harrison.
William Alexander Choperton,	*Detroit,*	Dr. Myrom.
John Norman Cowen,	*Ypsilanti,*	J. A. Watling.
Thomas Sears Ewing,	*Dexter,*	Faculty.
Sherman Fremont Finch,	*Adrian,*	J. W. Finch.
Mark Florus Finley,	*Ypsilanti,*	J. A. Harris.
Frank Oscar Gilbert,	*Bay City,*	H. B. Hurlbert.
Clark Lowell Gregory,	*Albion,*	Faculty.
John Aneid Griffith,	*Mansfield, O.,*	L. W. Nevins.
Herbert Frank Harvey,	*Cleveland, O.,*	D. R. Jennings.
George Thomas Higgins,	*Brooklyn, N. Y.,*	Faculty.
Herbert Alonzo Hunt,	*St. Clairville, N. Y.,*	A. A. Stone.
William Milo Hunt,	*Delaware, O.,*	S. P. Holbrook.
Henry Elmore Jennings,	*Saybrook, Ill.,*	J. M. Cuyler.
George Fred Kimball,	*Ypsilanti,*	Faculty.
Alvin Knapp,	*Ft. Wayne, Ind.,*	J. Knapp.
John Augustus Lally,	*Grattan,*	L. A. Rogers.
Fremont Ernest Lyon,	*Akron, O.,*	M. Chapman.
James Buchanan McGregor,	*Detroit,*	J. A. Watling.
Alonzo Franklin Miller,	*Fostoria, O.,*	C. E. Davis.
Benjamin Franklin Miller,	*Ypsilanti,*	J. A. Watling.
William H. Miller,	*Columbiana, O.,*	A. S. Sampseil.
William Mitchell,	*Delaware, O.,*	M. C. Steeves.
Charles Alfred Openheimer,	*Fort Wayne, Ind.,*	J. Knapp.
Henry Bristor Orr,	*Mansfield, O.,*	J. R. & T. C. Bristor.
Eben Levi Parker,	*Birmingham,*	C. T. Stroud.
John Nelson Reynolds,	*Lanesboro, Pa.,*	H. Pennipacker.
James Elias Rose,	*Delaware, O.,*	M. C. Sim.
Howard Treat Sackett,	*Talmadge, O.,*	D. E. Fenn.
Ira Emmet Sampsell,	*Columbiana, O.,*	H. A. Sampsell.

NAME.	RESIDENCE.	PRECEPTOR.
Charles Warren Sanderson,	*St. Clairville, N. Y.*,	A. A. Stone.
Samuel Bartlett Short,	*LaGrange, Ind.*,	A. C. Beecher.
Willard Judson Spencer,	*Le Roy*,	Faculty.
Isaac D. Sperling,	*Akron, O*,.	J. M. Segur.
James Wilberton Summers,	*Aylmer, Ont.*	A. McKenney.
Frank H. Waldron,	*Brimfield, O.*,	J. S. Pitkin.
Corydon L. Ford Wall,	*Cambridge, O.*,	T. F. Hunter.
Frank Ernest Wells,	*Ovid*,	C. D. Snover.
Sylvester Hasford Wheeler,	*Montreal, P. Q.*,	Practitioner.
George Henry Wilson,	*Painesville, O.*,	D. C. Wilson.

SUMMARY OF STUDENTS.

DEPARTMENT OF LITERATURE, SCIENCE AND THE ARTS.

RESIDENT GRADUATES	7	
SENIORS	65	
JUNIORS	49	
SOPHOMORES	76	
FRESHMEN	147	
IN SELECTED STUDIES	21	365

DEPARTMENT OF PHARMACY.

SECOND YEAR	25	
FIRST YEAR	44	69

THE POLYTECHNIC SCHOOL CONTAINS—		
From the above Departments	127	

DEPARTMENT OF MEDICINE AND SURGERY.

STUDENTS—Total in the Department		296

DEPARTMENT OF LAW.

SENIORS	155	
JUNIORS	229	384

HOMŒOPATHIC MEDICAL COLLEGE.

STUDENTS—Total		73

COLLEGE OF DENTAL SURGERY.

STUDENTS—Total		43
Total in the University		1230

SUMMARY BY STATES,

IN DEPARTMENTS AND IN CLASSES.

STATES AND COUNTRIES	Resident Graduates.	Seniors.	Juniors.	Sophomores.	Freshmen.	Select.	Total in the Literary Department.	Pharmacy.	Medical.	Law.	Homœopathy.	Dental.	Total in the University.
Michigan	7	40	32	52	103	11	248	35	134	130	41	17	605
Illinois	......	6	4	7	10	1	28	5	14	46	4	1	98
Ohio	......	2	1	2	9	2	16	5	11	47	3	16	98
New York	......	4	2	1	3	3	13	4	39	18	12	3	89
Pennsylvania	......	2	......	1	2	......	5	2	21	23	5	1	57
Indiana	......	2	3	4	6	......	15	2	12	27	1	3	60
Wisconsin	......	2	3	3	5	......	13	3	5	10	1	......	32
Canada	......	......	......	......	......	......	......	......	16	4	2	2	24
Minnesota	......	......	......	1	2	......	3	2	5	11	1	......	25
Iowa	......	2	1	......	2	......	5	1	2	5	......	......	13
Missouri	......	......	......	1	......	1	2	6	9	3	2	......	22
Kansas	......	1	1	......	1	......	3	......	2	14	......	......	19
Massachusetts	......	......	1	......	1	......	2	1	6	1	......	......	10
California	......	......	1	......	......	......	1	......	1	8	......	......	10
Kentucky	......	1	......	1	......	......	2	......	1	5	......	......	8
Vermont	......	......	......	......	......	......	......	......	1	3	......	......	4
Connecticut	......	......	......	......	......	......	......	......	1	1	1	......	3
Arkansas	......	......	......	1	......	......	1	......	2	1	......	......	4
Texas	......	1	......	1	1	......	3	1	......	1	......	......	5
Oregon	......	......	......	......	......	......	......	......	1	3	......	......	4
Nebraska	......	......	......	......	......	......	......	1	3	2	......	......	6
Colorado	......	......	......	......	1	......	1	......	......	3	......	......	4
Maine	......	......	......	......	......	......	......	......	......	4	......	......	4
West Virginia	......	......	......	......	......	......	......	......	1	2	......	......	3
New Hampshire	......	......	......	......	......	......	......	......	2	2	......	......	4
New Jersey	......	......	......	......	1	......	1	......	......	2	......	......	3
Delaware	......	......	......	......	......	......	......	......	1	1	......	......	2
District of Columbia	......	......	......	......	......	......	......	......	2	......	......	......	2
Louisiana	......	1	......	......	......	......	1	......	......	......	......	......	1
Tennessee	......	......	......	......	1	......	1	......	......	......	......	......	1
Rhode Island	......	1	......	......	......	......	1	......	......	......	......	......	1
Montana	......	......	......	......	......	......	......	......	......	1	......	......	1
Dakota	......	......	......	......	......	......	......	......	......	1	......	......	1
Nevada	......	......	......	......	......	......	......	......	1	......	......	......	1
Armenia, Asia	......	......	......	......	......	......	......	......	1	......	......	......	1
Japan	......	......	......	......	......	......	......	......	......	2	......	......	2
Russia	......	......	......	......	......	......	......	......	1	......	......	......	1
Porto Rico, W. I.	......	......	......	......	......	......	......	......	1	......	......	......	1
Hawaiian Islands	......	......	......	......	......	......	......	......	......	1	......	......	1
Total	7	65	49	76	147	21	365	69	296	384	73	43	1230

CALENDAR

OF THE

UNIVERSITY OF MICHIGAN

FOR

1878-9.

ANN ARBOR:
PUBLISHED BY THE UNIVERSITY.
1879.

ANN ARBOR PRINTING AND PUBLISHING COMPANY.

PREFATORY NOTE.

It is thought advisable to direct attention to a change in the arrangement of the matter in the CALENDAR, and to some important modifications in the work of the University.

In this CALENDAR the work of all the Departments is first described, and then the names of the Faculties and the students of the several Departments are given.

The important changes introduced at the beginning of this University year in the Department of Literature, Science and the Arts are set forth at length in the appropriate place. It will be seen that a large liberty in election of studies is permitted, and that an opportunity is afforded to each student to make the most rapid advancement or to secure the broadest culture possible for him, without being delayed by others, who are less gifted or less assiduous. Provision is made for admitting students who have completed the so-called English course of our Michigan High Schools, or one of equal value, to studies which lead to the attainment of Bachelor of Letters. Persons at least twenty-one years of age, who do not desire to become candidates for a degree, can be admitted without examination, to pursue special studies. After 1881 the degrees of Bachelor of Philosophy and Master of Philosophy will not be conferred, and the degrees of Civil Engineer and Mining Engineer will be given only as second degrees. From this time second degrees will be conferred only on examination, and after the completion of thirty of our "Courses."

On and after 1880 applicants for admission to the School of Pharmacy, who are not graduates of High Schools, or of Academies of equal grade, will be asked to sustain an examination in English, in Arithmetic, in Algebra through simple equations, and in a year's study of Latin or of German.

On and after 1879 a longer term of residence and study than the present will be required of candidates for graduation in the Dental College.

ANNOUNCEMENTS FOR 1879-80.

	1879.	
January	7.	University Exercises resumed after Holiday Vacation.
February	10.	*Semi-Annual Examinations in the Department of Literature, Science and the Arts begin.*
February	14.	(Evening.) *First Semester closes.*
February	17.	*Second Semester begins.*
March	25.	(Evening.) Recess of one week begins.
March	26.	The Law School and the Dental College Close. Commencement.
June	16-20.	*Semi-Annual Examinations in the Department of Literature, Science and the Arts.*
June	21-23.	*Examination of Candidates for Admission to the above Department.*
June	22.	*Baccalaureate Address.*
June	24.	Class-Day.
June	25.	*Alumni-Day.*
June	26.	Commencement in the Department of Literature Science and the Arts, the Department of Medicine and Surgery, the School of Pharmacy, and the Homœopathic Medical College. Summer Vacation begins.
Sept.	18-23.	*Examination of Candidates for Admission to the Department of Literature, Science and the Arts.*
Sept.	24.	First Semester begins.
Sept.	24.	*Examination for admission to the School of Pharmacy.* First year's work begins.
Sept.	29-30.	*Examinations for Admission to the Department of Medicine and Surgery, the Homœopathic Medical College and the Dental College.*
October	1.	Professional Schools open.
November	—.	Thanksgiving Recess of three days, beginning Tuesday evening.
December	19.	(Evening.) Holiday Vacation begins.
	1880.	
January	6.	Exercises resumed.
February	9.	*Semi-Annual Examinations in the Department of Literature, Science and the Arts begin.*
February	13.	(Evening.) First Semester closes.

BOARD OF REGENTS.

JAMES B. ANGELL, LL. D.,
PRESIDENT.

NAME.	RESIDENCE.	TERM EXPIRES.
HON. CLAUDIUS B. GRANT,	*Houghton,*	1880
HON. CHARLES RYND,	*Adrian,*	1880
HON. EDWARD C. WALKER,	*Detroit,*	1882
HON. ANDREW CLIMIE,	*Leonidas,*	1882
HON. BYRON M. CUTCHEON,	*Manistee,*	1884
HON. SAMUEL S. WALKER,	*St. Johns,*	1884
HON. GEORGE DUFFIELD, D. D.,	*Lansing,*	1886
HON. GEORGE L. MALTZ,	*Alpena,*	1886

HENRY D. BENNETT,
SECRETARY AND STEWARD.

WILLIAM A. TOLCHARD,
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CORNELIUS A. GOWER, M. A.,
SUPERINTENDENT OF PUBLIC INSTRUCTION.

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HENRY C. POTTER, M. A.,	EAST SAGINAW.
HON. JOHN W. STONE,	GRAND RAPIDS.
DANIEL B. BRIGGS, M. A.,	ROMEO.

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IN THE DEPARTMENT OF MEDICINE AND SURGERY.

WILLIAM BRODIE, M. D.,	DETROIT.
HOMER O. HITCHCOCK, M. D.,	KALAMAZOO.

EXAMINERS

IN THE HOMŒOPATHIC MEDICAL COLLEGE.

ALFRED I. SAWYER, M. D.,	MONROE.
CHARLES S. MORLEY, M. D.,	PONTIAC.

MEMBERS OF THE FACULTIES

AND OTHER OFFICERS.

JAMES B. ANGELL, LL. D.,
PRESIDENT.

REV. GEORGE P. WILLIAMS, LL. D.,
Emeritus Professor of Physics.

ALONZO B. PALMER, M. D.,
Professor of Pathology and the Practice of Medicine.

CORYDON L. FORD, M. A., M. D.,
Professor of Anatomy and Physiology.

HENRY S. FRIEZE, LL. D.,
Professor of the Latin Language and Literature.

HON. JAMES V. CAMPBELL, LL. D.,
Marshall Professor of Law.

HON. THOMAS M. COOLEY, LL. D.,
Jay Professor of Law.

JAMES C. WATSON, PH. D., LL. D.,
Professor of Astronomy and Director of the Observatory.

EDWARD OLNEY, LL. D.,
Professor of Mathematics.

CHARLES K. ADAMS, M. A.,
Professor of History.

CHARLES A. KENT, M. A.,
Fletcher Professor of Law.

REV. BENJ. F. COCKER, D. D., LL. D.,
Professor of Moral and Mental Philosophy.

ALBERT B. PRESCOTT, M. D.,
Professor of Organic and Applied Chemistry and Pharmacy.

MARTIN L. D'OOGE, PH. D.,
Professor of the Greek Language and Literature.

GEORGE S. MORRIS, M. A.,
Professor of Modern Languages and Literature.

CHARLES E. GREENE, M. A., C. E.,
Professor of Civil Engineering.

GEORGE E. FROTHINGHAM, M. D.,
Professor of Materia Medica and Ophthalmic and Aural Surgery.

DONALD MACLEAN, M. D.,
Professor of Surgery.

EDWARD S. DUNSTER, M. D.,
Professor of Obstetrics and Diseases of Women and Children.

MOSES COIT TYLER, LL. D.,
Professor of the English Language and Literature.

WILLIAM H. PETTEE, M. A.,
Professor of Geology, in Charge of Mining Engineering.

SAMUEL A. JONES, M. D.,
Professor of Materia Medica, Therapeutics and Experimental Pathogenesy in the Homœopathic Medical College.

JONATHAN TAFT, D. D. S.,
Professor of the Principles and Practice of Operative Dentistry.

JOHN A. WATLING, D. D. S.,
Professor of Clinical and Mechanical Dentistry.

JOHN W. LANGLEY, S. B., M. D.,
Professor of General Chemistry, in Charge of Metallurgy.

WILLIAM P. WELLS, M. A.,
Kent Professor of Law.

W. L. B. JENNEY,C. E,*
Professor of Architecture and Design.

EDWARD C. FRANKLIN, M. D.,
Professor of Surgery in the Homœopathic Medical College.

CHARLES GATCHELL, M. D.,
Professor of Theory and Practice of Medicine in the Homœopathic Medical College.

CHARLES K. WEAD, M. A.,
Acting Professor of Physics.

EDWARD L. WALTER, PH. D.,
Assistant Professor of Latin.

ALBERT H. PATTENGILL, M. A.,
Assistant Professor of Greek.

JOSEPH B. DAVIS, C. E.,
Assistant Professor of Civil Engineering.

WOOSTER W. BEMAN, M. A.,
Assistant Professor of Mathematics.

JOSEPH B. STEERE, PH. D.,
Assistant Professor of Zoölogy and Paleontology.

ISAAC N. DEMMON, M. A.,
Assistant Professor of Rhetoric and History.

CHARLES N. JONES, B. A.,
Assistant Professor of Mathematics.

RAYMOND C. DAVIS,
Librarian.

P. R. B. DE PONT, B. A., B. S.,
Instructor in French.

CHARLES S. DENISON, M. S., C. E.,
Instructor in Engineering and Drawing and Assistant in Architecture.

ALFRED HENNEQUIN, M. A.,*
Instructor in French and German.

VOLNEY M. SPALDING, M. A.,
Instructor in Zoölogy and Botany.

CALVIN THOMAS, M. A.,
Instructor in Modern Languages.

OTIS C. JOHNSON, M. A.,
Assistant in Chemical Laboratory (Qualitative Analysis) and Purchasing Agent.

WILLIAM J. HERDMAN, M. D.,
Demonstrator of Anatomy.

VICTOR C. VAUGHAN, PH. D., M. D.,
Assistant in Chemical Laboratory.

KATE CRANE JOHNSON, PH. C.,
Accountant in Chemical Laboratory.

LOUISA REED STOWELL, M. S.,
Assistant in Microscopical Botany.

CHARLES H. STOWELL, M. D.,
Instructor in Physiological Laboratory.

BYRON W. CHEEVER, M. A., M. D.,
Assistant in Chemical Laboratory (Quantitative Analysis and Assaying.)

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*Absent on leave.

WILLIAM H. DORRANCE,
Demonstrator of Dentistry.

ELIZABETH M. FARRAND,
Assistant Librarian.

DENNIE J. HIGLEY. M. A.,
Assistant in Museum.

ALEXANDER C. MACLEAN, M. D.,
Hospital Surgeon.

DOUGLAS A. JOY, M. E.,
Assistant in General Chemistry.

JOHN M. SCHAEBERLE, C. E.,
Assistant in the Observatory.

ARTHUR HUBE VANDIVERT,
Assistant in Chemical Laboratory.

BYRON FRANCIS DAWSON,
Assistant in Chemical Laboratory.

ASSISTANTS IN THE DEPARTMENT OF MEDICINE AND SURGERY.

GEORGE A. HENDRICKS, M. D.,
Assistant Demonstrator of Anatomy.

LUCIAN G. NORTH, M. D.,
Assistant to the Professor of Pathology and Practice of Medicine and Clerk of the Faculty.

GEORGE BYRON AYRES, M. D.,
Assistant to the Professor of Anatomy and Physiology.

JAMES HARVEY LYON, M. D.,
Assistant to the Professor of Obstetrics and Diseases of Women and Children.

ASSISTANTS IN THE HOMŒOPATHIC MEDICAL COLLEGE.

GEORGE A. TABOR, M. D.,
Assistant to the Professor of Materia Medica, Therapeutics and Experimental Pathogenesy.

FRANK E. BODEMANN, Ph. C., M. D.,
Assistant to the Professor of Surgery.

UNIVERSITY OF MICHIGAN.

THE UNIVERSITY AND THE STATE.

The University of Michigan is a part of the public educational system of the State. The Constitution of the State provides for the perpetuation of the governing body of the Institiion, the Board of Regents. They are elected for terms of eight years by popular vote. In accordance with the law of the State the University aims to complete and crown the work which is begun in the public schools, by furnishing ample facilities for liberal education in Literature, Science and the Arts, and for thorough professional study of Medicine, Law and Dentistry. Through the aid which has been received from the United States and from the State it is enabled to offer its privileges without charge for tuition, to all persons of either sex who are qualified for admission. Its relation to the public schools of the State has now become even closer and more vital than formerly, since under certain conditions the graduates of High Schools are received into the University without examination. While Michigan has endowed her University primarily for the higher education of her own sons and daughters, it must be understood that she also opens the doors of the Institution to all students, wherever their homes. Students from other States are asked to pay a larger admission fee than students from Michigan, but they receive their instruction and have access to all the advantages of life at the University, without incurring auy charge for tuition. It is in this broad, generous and hospitable spirit that the University has been founded, and that it endeavors to do its work.

ORGANIZATION OF THE UNIVERSITY.

The University comprises the Department of Literature, Science and the Arts, (including the School of Mines), the Department of Medicine and Surgery, the Department of Law, the School of Pharmacy, the Homœopathic Medical College and the Dental College. Each of these Departments and Colleges has its Faculty of Instruction, who are charged with the special management of it. The University Senate is composed of all the Faculties, and considers questions of common interest and importance to them all.

In the Department of Literature, Science and the Arts, different lines of study lead to the attainment of the degrees of Bachelor of Arts, Bachelor of Science, Bachelor of Philosophy, Bachelor of Letters, Civil Engineer and Mining Engineer.*

Post-graduate courses are provided for the graduates of this University, or for the graduates of any College or University who may desire to pursue advanced study whether for a second degree or not. Students who do not wish to become candidates for a degree may, if they are prepared to enter the University, pursue selected studies for such time, not less than one semester, as they may choose.

The School of Pharmacy is now established as a distinct School, and has a regular course of two years, leading to the degree of Pharmaceutical Chemist.

In the Professional Schools the instruction is given largely by lectures. Degrees are given to graduates as follows: In the Department of Medicine and Surgery, the degree of Doctor of Medicine; in the Department of Law, the degree of Bachelor of Laws; in the Homœopathic Medical College, the degree of Doctor of Medicine; in the Dental College, the degree of Doctor of Dental Surgery.

Students in any Department of the University may enter the classes in any other, upon obtaining permission from the Faculties of the respective Departments.

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*After 1881 the degree of Bachelor of Philosophy will not be conferred and the degrees of Civil Engineer and Mining Engineer will be conferred only as second degrees. The description of the Higher Degrees will be found in the Chapter devoted to the Department of Literature, Science and the Arts.

THE LIBRARIES.

The Libraries of the University accessible to the students amount, in the aggregate, to about 34,600 volumes.

The General Library contains about 26,000 volumes, and over 8,000 pamphlets. In 1871 it was enlarged by the addition of the library of the late Prof. Rau, the distinguished Professor of Political Economy in the University of Heidelberg, Germany. The Rau Library was purchased and presented to the University by PHILO PARSONS, ESQ., of Detroit. It contains about 4,000 volumes and over 5,000 pamphlets. It is especially rich in European works on the Science of Government, Statistics, Political Economy, and cognate subjects. An annual appropriation of two thousand five hundred dollars for the enlargement of the University Library was made by the Legislature at its last session.

The Catalogue consists of two parts, a catalogue of titles on slips, arranged in the alphabetical order of the names of the authors, and a catalogue of the subjects treated in all the books and reviews and magazines in the Library. This catalogue is accessible to readers.

One hundred American and European periodicals are taken, and fifty-five magazines and newspapers, representing nearly every part of the country, are kept upon the tables by the Students' Lecture Association.

The Library is open every week day from 9 o'clock A. M. to 5 P. M., and from 7 P. M. to 9½ P. M., and is free to all persons.

The Medical Library containing about 2,000 volumes, is in the room of the General Library. Thirty Medical Journals are regularly received.

The Law Library, kept in the second story of the Law Building, is open to the students of the Law Department nine hours daily. It contains about 3,500 volumes.

The two Literary Societies in the Department of Literature, Science and the Arts, have also good Libraries.

The Christian Association connected with the University has a well selected Library of moral and religious works. Donations to this Library would be gladly received.

THE ASTRONOMICAL OBSERVATORY.

The Observatory was founded by donations from citizens of Detroit. Valuable additions and improvements have been made by means of funds contributed from the same source, and also by the Regents of the University and the city of Ann Arbor. The building consists of a main part, with a movable dome, and two wings. The east wing contains the large meridian circle presented by Henry N. Walker, Esq., of Detroit. It was constructed by the famous makers, Pistor & Martins, of Berlin, and is one of the largest and best of the kind. The same room contains a sidereal clock, made by Tiede, of Berlin, and the collimators for the meridian circle. The west wing contains the library of the Observatory, and the smaller instruments. One of these is a chronograph with Bond's new isodynamic escapement, for recording observations by the electro-magnetic method. This wing connects with the residence of the Director. In the dome is mounted a large refracting telescope, with an object glass thirteen inches in diameter, constructed by the late Henry Fitz, of New York.

Through the liberality of the Legislature means have been provided for the erection of a small Observatory for the purpose of instruction, on the Observatory grounds near the main building. It will contain an equatorial telescope of six inches aperture, and a transit instrument, with zenith telescope attachment, so mounted as to be used either in the meridian or in the prime vertical. In the same enclosure is also a building containing computing rooms and rooms for observers, and a workshop where necessary repairs and attachments for the instruments can be made.

Students of Civil Engineering will receive instruction in the use of portable astronomical instruments and those who elect the study of Theoretical Astronomy, will receive instruction in the theory and use of instruments, and will have an opportunity to participate in the observations.

THE MUSEUM.

The collections in the University Museum are illustrative of Natural Science, Ethnology, Art, History, Agriculture, Anatomy and Materia Medica, and are constantly increasing. Prof. HARRINGTON, while connected with the United States expedition to the Aleutian Islands, secured important ethnological and other additions to the Museum. The whole of the valuable collection which Prof. STEERE made during his five years' explorations in South America, Formosa and the East Indies, is now here. The following description will indicate the character of the collections now in the Museum:

I. NATURAL HISTORY.

I. The MINERALOGICAL collection comprises about 6,000 specimens. It embraces about 2,500 specimens (principally European) purchased of the late Baron LEDERER, and known as the LEDERER COLLECTION; and, besides others, a rich collection of the MINERAL SPECIES OF MICHIGAN, including all the varieties of copper ore and associated minerals from the different localities of the Lake Superior mining district.

II. The collection in GEOLOGY consists of:

1. The large and complete series of lithological and paleontological specimens brought together by the State Geological Surveys, of which over a hundred fossil species have already become the types of original descriptions.

2. The WHITE COLLECTION, consisting of 1,018 distinct entries, and 6,000 specimens.

3. The ROMINGER COLLECTION, embracing about 2,500 entries and 6,000 specimens, mostly from the Mesozoic formations of Central Europe. This collection embraces about 500 specimens of Mesozoic Ammonites.

4. SMITHSONIAN DEPOSITS, consisting for the present of a collection of foreign and domestic specimens of building stones, and twenty-three specimens of fossils from the Upper Missouri.

5. MISCELLANEOUS DONATIONS AND COLLECTIONS, embracing more than four cases illustrating the metalliferous regions of the Upper Peninsula, collected by Prof. WINCHELL.

An interesting collection of fossils, chiefly cretaceous, from the Yellow Stone Valley, presented by the late General CUSTER, U. S. A.

The entire Geological Cabinet is estimated to contain about 14,000 distinct entries, and 41,000 specimens.

III. The collections in ZOÖLOGY are very large, and comprise:

1. A complete suit of Birds which visit Michigan, with most of the Mammals of the State; a nearly complete series of the Reptiles found east of the Rocky Mountains; 2,000 species of Mollusca, embracing all the land and fresh-water forms of the Northern and Western States, and a considerable collection of the Fishes and Radiata.

2. The TROWBRIDGE COLLECTION. This is a series of 1,856 entries (3,000 specimens) in most of the classes of the Animal Kingdom, made by Lieut. TROWBRIDGE, (formerly Professor in the University), upon the Pacific coast, with numerous additions from the interior and eastern portions of the Continent, supplied by the Smithsonian Institution.

3. A collection of about 5,000 Coleoptera and Lepidoptera from the estate of the late GEORGE L. AMES, M. D., of Niles.

4. SMITHSONIAN DEPOSITS, consisting of about 200 skins of Birds from the Arctic Zone; 204 entries of Marine Shells from the Indo-Pacific and Panama, labelled by Mr. P. P. CARPENTER; 81 entries of Unionidæ; 250 entries of miscellaneous shells; in all, 535 entries of fresh-water and marine shells.

5. The STEERE ZOÖLOGICAL COLLECTION, comprising about 25,000 insects, 1,500 shells, 8,000 birds, and numerous representatives of other groups; total about 10,000 entries and 60,000 specimens.

6. A collection of specimens representing COMPARATIVE ANATOMY. This collection contains several perfect, typical skeletons, and comprises 250 species, 1,000 specimens.

7. MISCELLANEOUS COLLECTIONS AND DONATIONS. The whole number of entries in the Zoölogical Cabinet is about 23,250, and the whole number of specimens over 110,000.

IV. The BOTANICAL COLLECTION contains:

1. The plants of the State collected by the public surveys, and numbering about 1,175 species, 1,500 entries, and 9,000 specimens.

2. The Houghton Herbarium, collected by the late Prof. Douglas Houghton, M. D., and presented to the University by his widow, the late Mrs. R. R. Richards. It consists of 28 folio cases of dried and labelled plants from various parts of the United States, and is estimated to contain 1,800 species.

The Sager Herbarium, presented by Prof. Abram Sager, and containing about 1,200 species, and 5,000 specimens, collected mostly in the New England and Western States.

4. The Dr. Ames Herbarium, consisting of a serial collection of 7,000 specimens, and 10,500 duplicates, presented by the family of the late Dr. Ames of Niles, Michigan.

5. A collection of Alaskan plants, presented by Capt. W. H. Dall, of the U. S. Coast Survey.

6. A collection of 2,000 species of plants, presented by Prof. M. W. Harrington.

7. A collection of 225 species of mosses from Central Europe, presented by Prof. Paul Reinsch, Erlangen, Bavaria.

8. A collection of 408 species, over 800 specimens of Algæ, from Mr. Horace Averill.

9. The Steere Botanical Collection, which comprises 500 species, 2,500 specimens, mostly ferns.

10. The Adams Jewett Collection, consisting of 2,500 species, 5,000 specimens. This collection was a part of the estate of the late Adams Jewett, M. D., of Dayton, Ohio, and was presented (1868) by his heirs through H. S. Jewett, M. D., his son.

11. The Lemmon Collection of 460 species of California plants, presented by J. G. Lemmon.

12. A collection of 300 species from the Agricultural Department at Washington.

13. A collection of 3,000 German plants from S. S. Garrigues, State Salt Inspector, Saginaw.

14. A collection of truncheons of different varieties of woods from the United States, South America, China and other countries.

15. A collection of the seeds of native and cultivated plants.

The whole Botanical Cabinet contains 10,000 species, 20,000 entries, and 70,000 specimens. The Geological, Zoölogical and Botanical Cabinets, together, are estimated to contain 60,000 entries, and 255,000 specimens.

II. ARCHÆOLOGY AND RELICS.

This Department of the Museum contains various articles of domestic and warlike use among the North American Indians, and the Islanders of the South Pacific; numerous remains of the ancient Peruvians; many specimens of clothing, art, etc., of the Amazonian Indians, modern Peruvians, Chinese, Formosans, and natives of the East Indies and Alaska; and sundry relics and memorials of the enterprises of Peace as well as of our great Civil War. It seems eminently appropriate that the University of Michigan should make efforts to preserve memorials of the native tribes, so fast disappearing before the march of civilization; and it is earnestly hoped that this department of the Museum may be deemed a suitable place of deposit for any such relics in the possession of our citizens. A number of interesting relics from the Pacific Islands have been added by the Smithsonian Institution.

Efforts are making to found in the University a collection illustrating the materials, processes, and products of Agriculture and Horticulture. The nucleus of such a collection already exists in—1st, The Botanical and Zoölogical Cabinets, and the Cabinets of Economical Geology; 2d, A collection of the seeds of cereals and other field and garden crops; 3d, An interesting collection of textile fibres and various substitutes for cotton, received from the Department of Agriculture at Washington.

III. THE FINE ARTS AND HISTORY.

This collection was commenced in the year 1855, and at present comprises:

1. A gallery of Casts, in full size and in reduction, of the most valuable ancient Statues and Busts. These were mainly executed at the imperial modelling establishment of the Louvre, by Desachy, of Paris, and by the Brothers Micheli, of Berlin.

2. A gallery of more than two hundred Reductions and Models, in terra cotta and other materials. These represent Statues, Portraits, Busts, Vases, and other Antiquities in the Museo Borbonico, and other European Museums. They were executed at Naples.

3. A gallery of Engravings and Photographic Views, executed in Italy and Greece, illustrating especially the architectural and sculptural remains of ancient Rome, Pompeii, Pæstum, Athens and Corinth.

4. The HORACE WHITE COLLECTION OF HISTORICAL MEDALLIONS. comprising—1st, Four hundred and fifty Casts from Antique Gems in the Royal Museum at Berlin, illustrative of Ancient History; 2d, Over five hundred Casts illustrative of Mediæval History and of the Renaissance Period; 3d, About four hundred Medallion Portraits of leading Personages in Modern History.

5. A collection has been commenced of engraved copies of the great masterpieces of modern painting, beginning with those prior to Raphael.

6. The Statue of Nydia, and of Ruth Gleaning, by Randolph Rogers.

7. In addition to the above are several copies of Modern Statues, Busts, and Reliefs, by Michael Angelo, Canova, Thorwaldsen, and others, the most valuable of which are copies in bronze of the Muses, and of the Augustino and Julian di Medici of Michael Angelo.

A new Catalogue of this Museum has recently been prepared with great care by Prof. FRIEZE.

IV. ANATOMY AND MATERIA MEDICA.

The University has become the owner of the valuable Anatomical Museum, formerly the property of Prof. FORD, the results of his labor for many years in the preparation and purchase of materials for the direct purpose of most successful teaching.

It embraces a valuable collection of bones, amply illustrating healthy as well as diseased conditions, likewise the various changes from infancy to old age.

It contains numerous skulls, teeth and other preparations of great interest and value, by which not only the structure, but also the various stages in the development of both temporary and permanent teeth are well illustrated; as well as many valuable exhibitions of diseases of the teeth and associated parts, furnishing the Dental student important aid in the prosecution of his studies.

The arterial preparations are numerous, embracing complete and partial dissections, well preserved, exhibiting the normal as well as many abnormal arrangements of vessels, and furnishing ample facilities for studying the vascular system.

There are also models in wax, papier mache, and plaster of various parts of the body which they serve best to illustrate; and the Museum is rich in whatever can best advance the interests of the student.

The valuable collection of Prof. SAGER, illustrating the comparative craniology, neurology and embryology of the Vertebrata, and also the pathology and anatomy of the diseases of women, has been added to the property of the University, and to it accessions are annually made.

The department of the Museum illustrative of Materia Medica consists of a very complete set of crude Organic Medicinal substances, embracing between five and six hundred specimens, imported from Paris, put up in beautiful glass-covered half-gallon jars, of uniform appearance, finely displayed and arranged according to their order in Natural History; besides about one thousand other specimens of Simple Mineral and Vegetable Substances, and Pharmaceutical and Officinal. Preparations, Active Principles, etc., arranged in groups convenient for study.

Besides these actual specimens, Medical Botany is illustrated by between one hundred and two hundred large and finely colored Plates, framed and glazed, and displayed for observation.

All the above collections are arranged in galleries, for the purpose of rendering them accessible both to students and to visitors. The University affords a secure depository for objects of value and curiosity, and it is therefore to be hoped that the Museum will receive accessions by donations from various sources.

EXPENSES.

The only charges made by the University are: To residents of Michigan, an admission fee of ten dollars, and the annual payment of twenty dollars; to those who come from other States or countries, an admission fee of twenty-five dollars, and the annual payment of twenty-five dollars. A by-law of the Board of Regents provides as follows:

Every student before entering any department of the University, shall pay to the Treasurer the sum of ten dollars, if a resident of Michigan, and the sum of twenty-five dollars, if from any other State or country, as a matriculation fee. Each student shall also pay to the Treasurer annually twenty dollars, if a resident of Michigan, and twenty-five dollars if a resident of any other State or country, to be devoted to the payment of incidental expenses. Resident graduates are required to pay the same annual dues as undergraduates, and no student or graduate shall be allowed to enjoy the privileges of the University, except on presentation to the President of the Treasurer's receipt for all fees and dues specified in this or any other rule or regulation of the Board of Regents.

The name of no person shall be presented by any Faculty to the Board of Regents for a degree, till he has exhibited to the Faculty the receipt of the Treasurer for the payment of all dues, including the fee for diploma.

The admission fee is paid but once, and entitles the student to the privileges of permanent membership in any department of the University. The annual tax is paid the first year and every year thereafter.

There are no dormitories and no commons connected with the University. Students obtain board and lodging in private families for from three to five dollars per week. Clubs are also formed in which the cost of board is from one dollar and a half to two dollars and a half per week.

It is proper to say in answer to numerous inquiries, that the University does not undertake to furnish manual labor to students. Yet a considerable number of the students find in the city opportunity for remunerative labor.

Room rent varies from seventy-five cents to two dollars per week for each student.

The annual expenses of students in the Academic Department for the last few years, *including clothing and incidentals*, have been on the average, about $370. The expenses of Professional students are from $150 to $200 per term of six months.

RELATION OF STUDENTS TO THE CITY GOVERNMENT.

Students are temporary residents of the city, and, like all other residents, are amenable to the laws. Whenever guilty of disorder or crime, they are liable to arrest, fine and imprisonment, and can claim no peculiar exemption from public disgrace and legal penalties.

DEPARTMENT

OF

Literature, Science and The Arts.

ADMISSION OF CANDIDATES FOR DEGREES.

All candidates for admission must be at least sixteen years of age, and must present satisfactory evidence of good moral character.

I. CANDIDATES FOR THE DEGREE OF BACHELOR OF ARTS.

Candidates for this degree will be examined in the following studies:

1. ENGLISH LANGUAGE.—Each candidate will be required to write an essay of not less than two pages (foolscap), correct in spelling, punctuation, capital letters, grammar, and division into paragraphs, on a subject to be assigned at the time of the examination. The subject for 1879 will be taken from one of the following works: Shakespeare's Richard II., or Merchant of Venice; Scott's Waverley or Heart of Midlothian; Dickens's Nicholas Nickleby. Every applicant should be familiar with at least three of these works.

In 1880 the subject will be taken from one of the following: Shakespeare's As You Like It, or Macbeth; Scott's Antiquary, or Bride of Lammermoor; Hawthorne's House of the Seven Gables; Dickens's David Copperfield.

[In 1878, the subjects assigned for the applicants' choice were as follows: The Story of Brutus, from Shakespeare's Julius Cæsar; The Story of Amy Robsart, from Kenilworth; The Story of Tiny Tim, from the Christmas Carol.]

2. GEOGRAPHY.—General facts of Physical Geography, the Political Geography of Europe and the United States, and Ancient Geography, particularly that of Italy, Greece and Asia Minor.

3. HISTORY.—In Grecian History, the first three books of Smith's History of Greece, exclusive of the chapters on Literature and Art; an outline of Roman History, from the foundation of the City to the Battle of Actium; and of the History of the United States to the close of the Revolutionary War.

4. MATHEMATICS.—*Arithmetic.*—Fundamental Rules, Fractions, Common and Decimal, Denominate Numbers, Percentage, Proportion, Involution and Evolution, and the Metric System of Weights and Measures.

Algebra.—Fundamental Rules, Fractions, Simple Equations, Elimination, Involution and Evolution, the Calculus of Radicals, Quadratic Equations, Ratio, Proportion, and the Progressions, and an Elementary knowledge of Logarithms; *i. e.* through Olney's Complete School Algebra, or an equivalent in other authors.

Geometry.—Plane, Solid and Spherical Geometry, *i. e.*, the first two parts of Olney's Geometry, or an equivalent in other authors.

5. LATIN.—*Latin Grammar.*—Harkness's, or Allen and Greenough's.

Prose Composition.—Harkness's Introduction to Latin Composition, from page 50 to page 166; or forty-four exercises in Arnold's Latin Prose Composition, or an equal amount in Allen and Greenough's Latin Prose.

Reading.—Four books of Cæsar's Commentaries; six select Orations of Cicero, and the whole of the Æneid; or the first six books of the Æneid and an amount either of prose or poetry equivalent to the last six books.

In reading the last six books of the Æneid, the principal aim should be to acquire facility in translation, and increased knowledge of the Latin vocabulary. It is supposed that the student, already familiar with the style of Virgil, will be able to read this portion of the Æneid more easily and rapidly than an equal amount in any other text book.

The *Roman pronunciation of Latin* has been adopted.*

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*ROMAN PRONUNCIATION OF LATIN.—The University has adopted the following system of pronunciation, based upon the investigations of Corssen, and other eminent philologists, and now employed in its essential features in the Universities and leading schools of England, and in Harvard, Cornell, and other institutions of this country as being proved beyond question a close approximation to the Roman pronunciation in the time of Cicero.

6. GREEK.—*Grammar.*—Hadley's or Goodwin's; *the Etymology must be thoroughly mastered.*

Prose Composition —Jones's Exercises with special reference to the writing of Greek with the accents, and to the general principles of syntax. Arnold's Exercises are taken as an equivalent.

Reading.—Three books of Xenophon's Anabasis. The so-called continental sound of the vowels and diphthongs, and pronunciation according to the written accent, are preferred. In preparation Boise's First Greek Lessons will be found valuable.

Two full years of daily recitation in Greek are essential to success.

II. CANDIDATES FOR THE DEGREE OF BACHELOR OF LETTERS. (LATIN.)

Candidates for this degree will be examined in French or in German, and in all the studies required for the admission of candidates for the degree of Bachelor of Arts, excepting what is above repuired in Grecian History, in paragraph 3, and what is included in paragraph 6, GREEK.

1. FRENCH.—A general knowledge of all the principles of French Grammar and of French construction is required, together with some experience in the reading of easy, descriptive French. The amount of reading should be the equivalent of 75 pages in Bôcher's Otto's French Reader. Candidates using Duffet's French Method may prepare themselves in the whole of that work (2 Parts, including all the

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VOWELS.

Long.	*Short.*
a as in father.	a as in amend, or in quaff, (not as in hat.)
e as in they.	e as in met.
i as in machine.	i as in pity.
o as in go.	o as in police. (not as in cot.)
u as oo in too.	u as in pull, (not as in but.)
y as i.	

DIPHTHONGS.

In pronouncing the diphthongs the sound of both vowels is preserved:

ae as the word ay.
au as ow in power.
oe as oi in oil.
eu nearly like u in use.
u in ua, ue, etc., like w.
ei as in rein.

CONSONANTS.

c always as in can.
ch as k.
g always as in gun.
j always as y in young.
s always as in sin.
t always as in tin.
v either as French ou in oui, or like Eng. v.

There is still considerable diversity of opinion among scholars as to the correct sound of v, and though the sound of ou in the French oui, or practically the sound of our w, is given to this consonant here, the sound of English v may be given, if preferred. The other consonants are sounded as in English.

The rules for syllabication are the same as in the old pronunciation, where two consonants come together; but a single consonant between two vowels is to be joined in pronunciation with the latter.

French reading matter therein contained) and in the equivalent of 35 pages of Böcher's Reader. Those using Fasquelle's or Otto's French Course, may learn with profit the French verbs from Hennequin's Treatise on the French Verbs, and are recommended so to do.

2. GERMAN.—Those who offer German should be prepared for examination upon the whole of Whitney's German Grammar, excepting the portions printed with the finest type, and excepting also §§ 393–425 and 447–469; also on exercises 1-29 in the supplement to the Grammar ("Exercises for translating from English into German"); and on 75 pages of Whitney's German Reader. If other text books are used, an equivalent in kind and substance must be offered.

III. CANDIDATES FOR THE DEGREE OF BACHELOR OF SCIENCE.

Candidates for this Degree will be examined in the following studies, *except that those who are to study Civil Engineering or Mining Engineering will not be examined in Botany or in Latin.*

1. ENGLISH LANGUAGE, GEOGRAPHY AND MATHEMATICS.—In all, same as candidates for B. A.

2. HISTORY.—Swinton's, or Freeman's or Anderson's Manual of General History, or an equivalent.

3. FRENCH OR GERMAN.—Same requirements as for candidates for B. L. (Latin.)

4. NATURAL PHILOSOPHY.—Norton's Natural Philosophy or an equivalent.

5. BOTANY.—The Elements of Vegetable Anatomy and Physiology, as given in the first 27 chapters of "Gray's Lessons," or the First and Second Parts of Wood's "Class Book of Botany."

In 1879, and thereafter, candidates for the degree of B. S. will be required to analyze and present written descriptions of 50 species of Phanerogams.

6. ZOÖLOGY.—The first Part of "Orton's Comparative Zoölogy," or its equivalent.

7. ENGLISH LITERATURE.—Shaw's Manual of English Literature (Backus' edition), or Stopford Brooke's English Literature.

8. CHEMISTRY.—Nichols's Abridgment of Eliot and Storer's Manual, or an equivalent.

LATIN.—The examination will be on Jones's First Latin Book, or Harkness's Latin Reader, or an equivalent amount in other text books. It is expected that about a year's study will have been given to the subject. This requirement is made with the intention of securing a sufficient knowledge of Latin to enable students to understand and to use readily technical scientific terms in Latin, or derived from Latin. It is recommended to students to make themselves familiar with the Latin nomenclature of Gray's Botany, and also with that of any good text book in Zoölogy.

IV. CANDIDATES FOR THE DEGREE OF BACHELOR OF LETTERS.

Persons who have completed the English course in any one of the approved High Schools of Michigan may hereafter be admitted to the University on diploma. Students who have pursued the English course in other schools may be admitted on examination.

The following list of studies, substantially that of the best High Schools of Michigan, will indicate the scope of the preparation required. Text books are named simply to indicate amounts:

1. HISTORY.—Swinton's Outlines of the World's History; Ridpath's History of the United States to the close of the Revolutionary War; Bright's History of England, Vol. I.; or Green's Shorter History, chapters I.-V., or the whole of Thompson or of Lancaster.

2. MATHEMATICS.—Arithmetic, including the Metric System; Olney's Complete Algebra, Olney's Geometry, Parts I. and II.

3. SCIENCE.—Gray's School and Field Book of Botany; Orton's Zoölogy; Norton's Natural Philosophy; Nichols's Abridgement of Eliot and Storer's Manual of Chemistry; Dana's Text-Book of Geology; Physical and Political Geography of Europe and America; Dalton's Physiology; Martin's Civil Government.

4. ENGLISH LANGUAGE.—Examination same as for candidates for B. A. The work done in the Michigan High Schools is indicated by the following list of text-books: Swinton's English Composition; Swinton's English Grammar; Swinton's Word Analysis; Hart's Rhetoric.

5. ENGLISH LITERATURE.—Shaw's English Literature (Backus' edition.)

Students will be examined on subjects rather than on specified text-books. Applicants who have not pursued the exact course marked out above will be allowed to present other subjects as equivalents, provided they have the preparation necessary to enter upon the studies required for the degree of Bachelor of Letters, as those studies are taught in the University.

ADMISSION OF STUDENTS WHO ARE NOT CANDIDATES FOR A DEGREE.

Students who are not less than sixteen years of age, and who do not desire to become candidates for a degree, will be admitted to the University, provided they pass the examinations for admission required of the candidates for any degree.

Students who are not less than *twenty-one years of age*, and who do not desire to become candidates for a degree, may be admitted *without the examination* asked in the previous paragraph, provided they give satisfactory eviden ce to the Faculty that they can profitably pursue the studies they desire to take up.

ADVANCED STANDING.

Candidates for advanced standing will be examined in the studies preparatory to admission to the University, and also in such undergraduate studies as they may ask to be credited with in advance.

THE EXAMINATION FOR ADMISSION.

An examination for admission to the Department of Literature, Science and the Arts, will take place on Saturday and Monday, June 21st and 23d, 1879, and another beginning on Thursday, September 18th, and continuing through the Friday and Saturday and Monday following. These examinations will begin at 9 o'clock A. M. of each day.

The candidate must be provided with credentials from his last instructor, or from the last institution with which he has been connected. These must be presented to the President at his office, before the candidate can enter upon the examination.*

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* Requests for specimen copies of examination papers are often sent to us. As our examinations for admission are chiefly oral, it is not practicable to comply with these requests.

2. A gallery of more than two hundred Reductions and Models, in terra cotta and other materials. These represent Statues, Portraits, Busts, Vases, and other Antiquities in the Museo Borbonico, and other European Museums. They were executed at Naples.

3. A gallery of Engravings and Photographic Views, executed in Italy and Greece, illustrating especially the architectural and sculptural remains of ancient Rome, Pompeii, Pæstum, Athens and Corinth.

4. The HORACE WHITE COLLECTION OF HISTORICAL MEDALLIONS. comprising—1st, Four hundred and fifty Casts from Antique Gems in the Royal Museum at Berlin, illustrative of Ancient History; 2d, Over five hundred Casts illustrative of Mediæval History and of the Renaissance Period; 3d, About four hundred Medallion Portraits of leading Personages in Modern History.

5. A collection has been commenced of engraved copies of the great masterpieces of modern painting, beginning with those prior to Raphael.

6. The Statue of Nydia, and of Ruth Gleaning, by Randolph Rogers.

7. In addition to the above are several copies of Modern Statues, Busts, and Reliefs, by Michael Angelo, Canova, Thorwaldsen, and others, the most valuable of which are copies in bronze of the Muses, and of the Augustino and Julian di Medici of Michael Angelo.

A new Catalogue of this Museum has recently been prepared with great care by Prof. FRIEZE.

IV. ANATOMY AND MATERIA MEDICA.

The University has become the owner of the valuable Anatomical Museum, formerly the property of Prof. FORD, the results of his labor for many years in the preparation and purchase of materials for the direct purpose of most successful teaching.

It embraces a valuable collection of bones, amply illustrating healthy as well as diseased conditions, likewise the various changes from infancy to old age.

It contains numerous skulls, teeth and other preparations of great interest and value, by which not only the structure, but also the various stages in the development of both temporary and permanent teeth are well illustrated; as well as many valuable exhibitions of diseases of the teeth and associated parts, furnishing the Dental student important aid in the prosecution of his studies.

The arterial preparations are numerous, embracing complete and partial dissections, well preserved, exhibiting the normal as well as many abnormal arrangements of vessels, and furnishing ample facilities for studying the vascular system.

There are also models in wax, papier mache, and plaster of various parts of the body which they serve best to illustrate; and the Museum is rich in whatever can best advance the interests of the student.

The valuable collection of Prof. SAGER, illustrating the comparative craniology, neurology and embryology of the Vertebrata, and also the pathology and anatomy of the diseases of women, has been added to the property of the University, and to it accessions are annually made.

The department of the Museum illustrative of Materia Medica consists of a very complete set of crude Organic Medicinal substances, embracing between five and six hundred specimens, imported from Paris, put up in beautiful glass-covered half-gallon jars, of uniform appearance, finely displayed and arranged according to their order in Natural History; besides about one thousand other specimens of Simple Mineral and Vegetable Substances, and Pharmaceutical and Officinal. Preparations, Active Principles, etc., arranged in groups convenient for study.

Besides these actual specimens, Medical Botany is illustrated by between one hundred and two hundred large and finely colored Plates, framed and glazed, and displayed for observation.

All the above collections are arranged in galleries, for the purpose of rendering them accessible both to students and to visitors. The University affords a secure depository for objects of value and curiosity, and it is therefore to be hoped that the Museum will receive accessions by donations from various sources.

EXPENSES.

The only charges made by the University are: To residents of Michigan, an admission fee of ten dollars, and the annual payment of twenty dollars; to those who come from other States or countries, an admission fee of twenty-five dollars, and the annual payment of twenty-five dollars. A by-law of the Board of Regents provides as follows:

Every student before entering any department of the University, shall pay to the Treasurer the sum of ten dollars, if a resident of Michigan, and the sum of twenty-five dollars, if from any other State or country, as a matriculation fee. Each student shall also pay to the Treasurer annually twenty dollars, if a resident of Michigan, and twenty-five dollars if a resident of any other State or country, to be devoted to the payment of incidental expenses. Resident graduates are required to pay the same annual dues as undergraduates, and no student or graduate shall be allowed to enjoy the privileges of the University, except on presentation to the President of the Treasurer's receipt for all fees and dues specified in this or any other rule or regulation of the Board of Regents.

The name of no person shall be presented by any Faculty to the Board of Regents for a degree, till he has exhibited to the Faculty the receipt of the Treasurer for the payment of all dues, including the fee for diploma.

The admission fee is paid but once, and entitles the student to the privileges of permanent membership in any department of the University. The annual tax is paid the first year and every year thereafter.

There are no dormitories and no commons connected with the University. Students obtain board and lodging in private families for from three to five dollars per week. Clubs are also formed in which the cost of board is from one dollar and a half to two dollars and a half per week.

It is proper to say in answer to numerous inquiries, that the University does not undertake to furnish manual labor to students. Yet a considerable number of the students find in the city opportunity for remunerative labor.

Room rent varies from seventy-five cents to two dollars per week for each student.

The annual expenses of students in the Academic Department for the last few years, *including clothing and incidentals,* have been on the average, about $370. The expenses of Professional students are from $150 to $200 per term of six months.

RELATION OF STUDENTS TO THE CITY GOVERNMENT.

Students are temporary residents of the city, and, like all other residents, are amenable to the laws. Whenever guilty of disorder or crime, they are liable to arrest, fine and imprisonment, and can claim no peculiar exemption from public disgrace and legal penalties.

II. GERMAN—FIRST SEMESTER.

1. Beginning German; Whitney's Text Books; German Plays. *Four times a week.* Asst. Prof. WALTER.
2. Lessing's Emilia Galotti. German Lyrics. *Five times a week.* Prof. MORRIS.

SECOND SEMESTER.

3. Whitney's Text Books; German Plays. *Four times a week.* Asst. Prof. WALTER.
4. Goethe's Faust. *Twice a week.* Prof. MORRIS.
5. Kluge; Geschichte der Deutschen Literatur. *Twice a week.* Prof. MORRIS.

Course 2 *is open to those who have completed Courses* 1 *and* 3; *Courses* 4 *and* 5 *to those who have completed Course* 2.

III. SPANISH—SECOND SEMESTER.

1. Spanish; DeVere's Grammar; Velasquez's Reader. *Twice a week.* Prof. MORRIS.

This Course will be given in 1878-9 *and not in* 1879-80.

IV. ITALIAN—SECOND SEMESTER.

1. Italian; Cuore's Italian Grammar; Foresti's Italian Reader. *Twice a week.* Prof. MORRIS.

This Course will be given in 1879-80, *but not in* 1878-9.

IV. ENGLISH LANGUAGE AND LITERATURE.

FIRST SEMESTER.

1. English Grammar and Rhetoric. *Twice a week.* Asst. Prof. DEMMON.
2. Rhetoric; Theory and Practice. *Twice a week.* Asst. Prof. DEMMON.
3. Extemporaneous Speaking. *Once a week* (*two hours*). Asst. Prof. DEMMON.
4. Anglo-Saxon. *Once a week.* Asst. Prof. DEMMON.
5. English Literature; Introductory. *Three times a week.* Prof. TYLER.
6. English Literature; Study of Masterpieces. *Twice a week* (*once, two hours; once, one hour.*) Prof. TYLER.

SECOND SEMESTER.

7. English Grammar and Speeches. *Twice a week.* Asst. Prof. DEMMON.

8. Rhetoric; Theory and Practice. *Twice a week.* Asst. Prof. DEMMON.
9. English Literature; Introductory. *Three times a week.* Prof. TYLER.
10. English Literature; Study of Chaucer. *Once a week.* Prof. TYLER.
11. English Literature; Study of Shakespeare. *Twice a week, (once, two hours; once, one hour.)* Prof. TYLER.

Courses 1 *and* 7, *and either Course* 2 *or Course* 8 *must precede Course* 3. *Course* 1 *or Course* 7 *must precede Course* 2 *or Course* 8. *Course* 5 *or Course* 9 *must precede Courses* 6, 10 *and* 11. *Course* 2 *and Course are substantially the same. Course* 5 *and Course* 9 *are substantially the same. Course* 3 *is reckoned as one-fifth of a full Course. Courses* 6 *and* 11 *are reckoned as three fifths of a full Course.*

V. HISTORY.

FIRST SEMESTER.

1. General History of England from the Accession of the House of Tudor to the overthrow of the Stuarts. *Twice a week.* Asst. Prof. PATTENGILL.
2. The History of Civilization in the Middle Ages. *Three times a week.* Prof. ADAMS.
3. The History of the English Government since the Death of George III. *Twice a week.* Prof. ADAMS.
4. The Constitutional Development of England from the Saxon Invasions to the death of William III. *The class is divided into sections, each section meeting once a week for two hours.* Prof. ADAMS.

Course 4 *is designed only for those who have taken Courses* 1 *and* 9. *In* 1878–9 *it may be taken by any who have completed the work of the third year, but by no others without special permission.*

5. History of the French Revolution (1789–1815). *Twice a week.* Prof. ADAMS.

Course 5 *will not be given in* 1878–9, *but the purpose is to give it in* 1879–80, *in place of Course* 3.

6. The Political History of America from the settlement of Jamestown to the adoption of the Articles of Confederation. *Twice a week.* Asst. Prof. DEMMON.

SECOND SEMESTER.

7. General History of Europe from the Revival of Learning to the Treaty of Westphalia. *Three times a week.* Prof. ADAMS.
8. The Rise and Development of Prussia. *Twice a week.* Prof. ADAMS.
   This Course will probably not be given in 1879–30.
9. General History of England from the Overthrow of the Stuarts to the Death of George III. *Twice a week.* Asst. Prof. PATTENGILL.

10. Political History of the United States from the Adoption of the Constitution to the Presidency of General Jackson. *Twice a week.* Asst. Prof. DEMMON.
11. Political History of the United States from the Election of President Jackson to the Outbreak of the Civil War. *Twice a week.* Asst. Prof. DEMMON.

Course 11 *will not be given in* 1878–9, *but is intended for* 1879–80.

12. Constitutional History of the United States from the close of the Revolutionary War to the adoption of the Federal Constitution. *Classes divided into sections, meeting once a week for two hours.* Prof. ADAMS.

Course 12 *is designed for those only who have taken Course* 6, *and at least two of the Courses on English History; but in* 1878–9 *it may be taken by any who have completed the studies of the third year.*

13. The Political History of the larger Nationalities of Europe, since the Overthrow of Napoleon I. *Twice a week.* Prof. ADAMS.

Course 13 *will not be given in* 1878–9, *but will probably be given in* 1879–80, *in place of Course* 8.

VI. PHILOSOPHY.

FIRST SEMESTER.

1. Psychology. *Twice a week.* Dr. COCKER.
2. Speculative Philosophy. *Five times a week.* Dr. COCKER.

SECOND SEMESTER.

3. Logic (Jevon's Logic); Ethics (Calderwood). *Twice a week.* Dr. COCKER.
4. Historical Philosophy. *Five times a week.* Dr. COCKER.

After 1878–9 *Courses* 1 *and* 3 *must precede Courses* 2 *and* 4. *It is recommended that Courses* 1 *and* 3 *be not taken up until the student has resided some time at the University.*

VII. POLITICAL ECONOMY.

FIRST SEMESTER.

1. Elementary Course. *Twice a week.* President ANGELL.
2. Advanced Political Economy. *Twice a week.* President ANGELL.

After 1878–9 *Course* 2 *will be open only to those who have completed Course* 1.

VIII. INTERNATIONAL LAW.

SECOND SEMESTER.

1. Lectures on International Law. *Twice a week.* President ANGELL.

IX. PHYSICAL SCIENCES.

I. PHYSICS—FIRST SEMESTER.

1. Experimental Physics. *Two lectures and one recitation a week.* Prof. WEAD.
2. Experimental Lectures with recitations from Text Books. *Five times a week.* Prof. WEAD.

SECOND SEMESTER.

3. Physical Laboratory Work (Full Course). *Five times a week.* Prof. WEAD.
4. Physical Laboratory Work. *Three times a week.* Prof. WEAD.
5. Higher Acoustics, including the Physical Basis of Music. *Once a week.* Prof. WEAD.
6. Teachers' course. See "Polytechnic School."

For admission to Course 1 *or Course* 2, *the Mathematics now required for entrance and Plane Trigonometry will be required; it is recommended that one full year's study of Mathematics be taken in the University before beginning Physics.*

For admission to Course 3 *or to Course* 4, *Course* 2 *of Physics and either Course* 1 *or Course* 2 *of Chemistry will be required, and a knowledge of the Elements of the Differential Calculus will be presupposed, though not absolutely required.*

For admission to Courses 5 *and* 6, *Course* 1 *or Course* 2 *is required. In Courses* 3 *and* 4 *provision is made for advanced students as well as for beginners.*

Where Course 1 *is required for graduation or for entrance to other classes, Course* 2 *may be substituted by the student.*

II. GENERAL CHEMISTRY—SECOND SEMESTER.

1. Experimental and descriptive Course in Heat, Electricity and Chemistry. *Three times a week.* Prof. LANGLEY.
2. Experimental and descriptive, accompanied with mathematical and review work in the class-room. *Five times a week.* Prof. LANGLEY.
3. Course on Chemical Philosophy and the Kinetic Theory of Gases. *Twice a week.* Prof. LANGLEY.

Course 1 *in Physics must precede Course* 1. *Course* 2 *in Physics must precede Course* 2. *Course* 3 *in General Chemistry must be preceded by Course* 2 *above.*

III. ANALYTICAL CHEMISTRY—FIRST SEMESTER.

1 and 2. Qualitative Analysis. *Five times a week in recitation and five times a week in Laboratory.* Mr. JOHNSON.

SECOND SEMESTER.

3. Qualitative Analysis (half semester). *Five times a week in the class-room and five times a week in the Laboratory.* Mr. JOHNSON.
4. Organic Chemistry. *Five times a week, including lectures and Laboratory work.* Prof. PRESCOTT.

EITHER FIRST OR SECOND SEMESTER.

5 and 6. Quantitative Analysis. *Three times a week in the class-room, and five times a week in the Laboratory.* Dr. CHEEVER.

7. Ultimate Organic Analysis. *Five times a week in the Laboratory.* Prof. PRESCOTT.
8. Physiological Chemistry. *Five times a week, including Laboratory work and lectures.* Dr. VAUGHAN.
9. Assaying of Ores. *Five times a week, including lectures and Laboratory work.* Dr. CHEEVER.
10. Blow-pipe Analysis. *Five times a week, including Laboratory work and lectures.* Dr. CHEEVER.
11. Original Investigations. *Five times a week, Laboratory work and reading.* Prof. PRESCOTT.

The Laboratory work requires from two to three hours daily.

Course 3 *is the continuation of Courses* 1 *and* 2, *and must precede* 4 *to* 11 *inclusive. Courses* 5 *and* 6 *in the second semester begin at the expiration of Course* 3. *Courses* 5 *and* 6 *must precede Courses* 7, 9 *and* 11.

Course 1 *or* 2, *General Chemistry, must precede any course in Analytical Chemistry.*

IV. MINERALOGY—FIRST SEMESTER.

1. Short Course in Mineralogy. *Designed especially for students in Civil Engineering (twice a week).* Prof. PETTEE.

SECOND SEMESTER.

2. Mineralogy and Lithology. *Designed especially for students in Mining Engineering. Five times a week.* Prof. PETTEE.

After 1878–9, *both Courses in Mineralogy must be preceded by Course* 1 *in Physics and Course* 1 *in General Chemistry. Course* 2 *must be taken either with or after a course in Analytical Chemistry.*

V. GEOLOGY—FIRST SEMESTER.

1. Physical Geography. *Twice a week.* Prof. PETTEE.
2. Structural Geology. *Three times a week.* Prof. PETTEE.
3. Economical Geology. *Twice a week.* Prof. PETTEE.
4. Geology of the United States. *Twice a week.* Prof. PETTEE.

SECOND SEMESTER.

5. Lithology and Structural Geology. *Designed especially for students in Civil Engineering. Twice a week.* Prof. Pettee.

After 1878–9 *all the courses in Geology must be preceded by Course* 1 *in Physics and Course* 1 *in General Chemistry. Course* 3 *will require a knowledge of Mineralogy. Courses* 3 *and* 4 *must be taken either with or after a course in Structural Geology.*

VI. ASTRONOMY—FIRST SEMESTER.

1. Theoretical Astronomy. *Five times a week.* Prof. Watson.

SECOND SEMESTER.

2. Astronomy; Lectures. *Once a week.* Prof. Watson.
3. Spherical and Practical Astronomy. *Designed especially for Engineers.* Prof. Watson.
4. Theoretical Astronomy. *Five times a week.* Prof. Watson.

Courses 1 *and* 4 *must be preceded by Course* 2, *and by Courses* 1, 2, 3, 5, 6 *in Mathematics. Course* 2 *must be preceded by Course* 1 *in Physics. Those who take it are required to have completed some elementary work in Astronomy, as Lockyer's, Loomis's or White's. Course* 3 *must be preceded by Courses* 1, 2, 3, 5, 6 *in Mathematics.*

X. BIOLOGICAL SCIENCES.

I. ZOÖLOGY—FIRST SEMESTER.

1. Comparative Physiology and Zoölogy. *Five times a week.* Asst. Prof. Steere.
2. Systematic Zoölogy; Lectures. *Five times a week.* Asst. Prof. Steere.
3. Invertebrates, with Identification of Species. *Five times a week.* Asst. Prof. Steere.

SECOND SEMESTER.

4. Comparative Anatomy of Invertebrates, with work in Microscopical Laboratory. *Five times a week.* Asst. Prof. Steere. In Laboratory, Mrs. Stowell.
5. Identification of Vertebrates and special study of the same. *Five times a week.* Asst. Prof. Steere.

Course 1 *must precede Course* 4. *Course* 2 *must precede Courses* 3 *and* 5.

II. BOTANY—FIRST SEMESTER.

1. Cryptogamic Botany. *Twice a week, and six hours a week in Microscopical Laboratory.*
2. Study of Crude Drugs, Spices and Adulterations. *Twice a week, and six hours in Microscopical Laboratory.*

SECOND SEMESTER.

3. Elementary, Structural and Physiological Botany. *Twice a week, and six hours in Microscopical Laboratory.*
4. Advanced Structural and Physiological Botany. *Three times a week.*
5. Systematic Botany. *Five times a week after April 8th.*

In each of these courses, except the 5th, both class-room work and work in the Microscopical Laboratory are required. The instruction in the class-room is given by Mr. SPALDING*; the instruction in the Laboratory by* Mrs. STOWELL and Mr. SPALDING.

Course 3 must precede Courses 1 and 4. Courses 2 and 5 are pursued by Pharmacy students. Course 2 must be preceded by Course 5.

The courses calling for two exercises a week in the class-room and six hours in the Microscopical Laboratory are considered as the equivalents of a study taken five times a week.

XI. CIVIL ENGINEERING.

I. DRAWING—FIRST SEMESTER.

1. Geometrical Drawing. *Twice a week.* Asst. Prof. DAVIS.
2. Topographical Drawing, Lettering and Ornamentation. *Twice a week.* Mr. DENISON.
3. Mechanical Drawing. *Three times a week.* Asst. Prof. DAVIS.
4. Free-hand Drawing; Pen and Ink Drawing. *Three times a week.* Mr. DENISON.

SECOND SEMESTER.

5. Descriptive Geometry. *Three times a week.* Asst. Prof. DAVIS.
6. Shades, Shadows and Perspective. *Three times a week.* Mr. DENISON.
7. Free-hand Drawing (Advanced.) *Three times a week.* Mr. DENISON.
8. Architectural Water-color Drawing. *Twice a week.* Mr. DENISON.

Course 1 precedes Course 4, and Course 4 must precede Course 5.

II. SURVEYING—FIRST SEMESTER.

1. Surveying; Use of Transit and Level. *Three times a week.* Asst. Prof. DAVIS.
2. Surveying with Compass; Solar Compass; U. S. Surveys. *Twice a week.* Asst. Prof. DAVIS.

SECOND SEMESTER.

3. Higher Surveying; Plane Table; Sextant; Earth-work. *Five times a week.* Asst. Prof. DAVIS.
4. Field Work. *Four weeks entire.* Asst. Prof. DAVIS.

Courses 1 and 2 presuppose a knowledge of Plane Trigonometry. Course 3 must be preceded by Courses 1 and 2.

III. CIVIL ENGINEERING—FIRST SEMESTER.

1. Strength and Resistance of Materials. *Twice a week.* Prof. GREENE.
2. Engineering; Theory of Construction. *Twice a week.* Prof. GREENE.
3. Graphical Analysis of Structures. *Once a week.* Prof. GREENE.
4. Engineering Design. *Five times a week.* Prof. GREENE.
5. Mechanism and Machine Drawing. *Twice a week.* Mr. DENISON.
6. Machinery and Prime Movers; Water Wheels and Steam Engines. *Three times a week.* Prof. GREENE.

SECOND SEMESTER.

7. Analytical and applied Mechanics. *Five times a week.* Prof. GREENE.
8. Engineering; Theory of Construction. *Four times a week.* Prof. GREENE.
9. Hydraulics; Water Supply and Sewerage. *Once a week.* Prof. GREENE.
10. Stereotomy. *Twice a week.* Mr. DENISON.

Courses 5 *and* 10 *must be preceded by Course* 4 *in Drawing. A knowledge of the Integral Calculus is requisite to pursue Course* 7, *and this Course* (7) *must precede Courses* 1, 2, 6, 8 *and* 9. *Course* 4 *accompanies Courses* 1, 2 *and* 8.

XII. MINING ENGINEERING.

I. MINING ENGINEERING—SECOND SEMESTER.

1. Mining. *Five times a week.* Prof. PETTEE.

II. METALLURGY—SECOND SEMESTER.

1. Metallurgy.

XIII. BIBLIOGRAPHY.

Mr. DAVIS, the Librarian, gives a Course of Instruction in Bibliography. It consists of Lectures delivered once a week during the months of November and December. This Course is not one of those to be counted as meeting the requirements for a degree.

TEACHERS' DIPLOMAS.

Any one who pursues courses of study with reference to preparation for teaching, and who by special examinations shows such marked proficiency as qualifies him to give instruction, may receive a special Diploma signed by the President and by the Professors who have charge of the studies he has taken with this object in view.

A special examination in the ancient and modern languages and mathematics for the Teacher's Diploma, will be held the week before the spring vacation. This Diploma is designed to be the certificate of qualification for teaching, and is the only form of recommendation which will be given by the Professors in charge of these studies.

REQUIREMENTS FOR GRADUATION.

PRELIMINARY EXPLANATION.

1. Five exercises a week during a semester, whether in recitations, Laboratory work, or lectures, shall constitute a *Full Course of study*. The completion of *twenty-four such Full Courses* is required to obtain the recommendation of the Faculty for the degree of Bachelor of Arts, or of Civil Engineer, or of Mining Engineer. The completion of *twenty-six such Full Courses* is required to obtain the recommendation for the degree of Bachelor of Philosophy, or of Bachelor of Science, or of Bachelor of Letters.

2. It is not essential that the exercises constituting a *Full Course* shall be in one and the same branch of study. Thus, a part (two, for instance) may be in Mathematics, a part (say two) in Greek, and a part (say one) in Latin, etc., making a total of five.

THE DEGREE OF BACHELOR OF ARTS.

To obtain the recommendation of the Faculty for the degree of Bachelor of Arts, the student *must* complete

Courses 1, 2, 3, 6, 7, 8,	in Greek.
Courses 1, 2, 6, 8,	in Latin.
Courses 1, 2, 5, 6,	in Mathematics.
Courses 7, either 2 or 8,	in English.
Course 1,	in Philosophy.
Course 1,	in Physics.
Course 1,	in General Chemistry.

These make *twelve and two-fifths Full Courses.* From the other courses offered the student must choose, and complete enough to be the equivalent of *eleven and three-fifths more Full Courses*, making in all twenty-four Full Courses.

THE DEGREE OF BACHELOR OF SCIENCE.

[*Observe on pp.* 42–43, *that the degree of Bachelor of Science will after* 1881 *be given to those who complete the studies in Civil Engineering and Mining Engineering.*]

To obtain the recommendation of the Faculty for the degree of Bachelor of Science the student *must* complete

Courses 1, 2, 5, 6,	in Mathematics.
Courses 2, 6,	in French.
Courses 1, 3,	in German.
Courses 1, either 2 or 8,	in English.
Course 1,	in Philosophy.
Course 2,	in Physics.
Course 2,	in General Chemistry.
Course 1,	in Zoölogy.
Course 3,	in Botany.
Courses 5, either 1 or 4,	in Drawing.

These make *twelve and three-fifths* (or if Drawing 4 be taken) *twelve and four-fifths Full Courses.* He *must* also elect at least

1. In History, the equivalent of one Full Course.
2. In Mineralogy and Geology, the equivalent of one Full Course.
3. In Astronomy, a one-fifth Course.
4. In the Chemical or the Physical Laboratory, one Full Course.
5. In the Microscopical Laboratory, one Full Course.
6. And in addition to these, from scientific studies the equivalent of three Full Courses.

From the other courses offered in the Department of Literature, Science and the Arts, he must choose and complete enough to make in all *twenty-six Full Courses.*

THE DEGREE OF BACHELOR OF PHILOSOPHY OR OF BACHELOR OF LETTERS. (LATIN.)*

To obtain the recommendation of the Faculty for the degree of Bachelor of Philosophy, or of Bachelor of Letters (Latin) the student *must* complete

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*The Degree of Bachelor of Philosophy will be conferred until 1881, and thereafter instead of that, the degree of Bachelor of Letters (Latin) will be given.

Courses 1, 2, 6, 7, 8, . .	in Latin.
Courses 1, 2, 5, 6, . . .	in Mathematics.
Courses 2, 6, . . .	in French.
Courses, 1, 3, ...	in German.
Courses 1, either 2 or 8, . .	in English.
Course 1, ...	in Philosophy.
Course 1, ...	in Physics.
Course 1, ...	in General Chemistry.
Some one Full Course, . .	in Science.

These make *thirteen Full Courses.*

From the other courses offered he must choose and complete enough to form the equivalent of *thirteen Full Courses*, making in all *twenty-six Full Courses.*

THE DEGREE OF BACHELOR OF LETTERS.

To obtain the recommendation of the Faculty for the degree of Bachelor of Letters the student *must* complete

Course 5, ...	in Mathematics.
Courses 1, 2, 5, 6, . . .	in French.
Courses 1, 2, 3, 4, 5, . . .	in German.
Courses 1, 2, or 8, 4, 5, or 9, 10, .	in English.
Course 1, ...	in Philosophy.
Some two *Full Courses* (to be chosen),	in Science.

These make *eleven and three-fifths Full Courses.* From the other courses offered the student must choose and complete the equivalent of *fourteen and two-fifths Full Courses*, making in all *twenty-six Full Courses.*

THE DEGREE OF CIVIL ENGINEER.*

To obtain the recommendation of the Faculty for the degree of Civil Engineer the student *must* complete

Courses 1, 2, 3, 5, 6, . . .	in Mathematics.
Courses 2, 6, . . .	in French.
Courses 1, 3, ...	in German.

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* This degree will be given until 1881. After that the degree of Bachelor of Science will be given to those who complete the studies above named, and that of Civil Engineer will be conferred only as a second degree.

Courses 1, either 2 or 8,	in English.
Course 2,	in Physics.
Course 2,	in General Chemistry.
Course 1,	in Mineralogy.
Course 5,	in Geology.
Course 3,	in Astronomy.
Courses 1, 2, 4, 5, 6,	in Drawing.
Courses 1, 2, 3, 4,	in Surveying.
Courses 1 to 10 inclusive,	in Civil Engineering.

These make *twenty-one Full Courses*. From the other courses offered he must choose and complete *three Full Courses*, making *twenty-four Full Courses* in all.

He must also prepare a satisfactory thesis.

THE DEGREE OF MINING ENGINEER.*

To obtain the recommendation of the Faculty for the degree of Mining Engineer the student *must* complete

Courses 1, 2, 3, 5, 6,	in Mathematics.
Courses 2, 6,	in French.
Courses 1, 3,	in German.
Courses 1, either 2 or 8,	in English.
Course 2,	in Physics.
Course 2,	in General Chemistry.
Courses 1, 2, 4, 7, 8,	in Analyt. Chemistry.
Course 2,	in Mineralogy.
Courses 2, 3,	in Geology.
Course 2,	in Astronomy.
Courses 1, 4, 5,	in Drawing.
Courses 1, 4,	in Surveying.
Courses 1, 2, 5, 6, 7,	in Civil Engineering.
Course 1,	in Mining Engineer'g.
Course 1,	in Metallurgy.

Some one Full Course to be elected.

A satisfactory thesis must also be prepared.

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*This degree will be given until 1881. After that date the degree of Bachelor of Science will be given to those who complete the studies above named, and that of Mining Engineer will be conferred only as a second degree.

REQUIREMENTS FOR THE HIGHER DEGREES.

1. To obtain the recommendation of the Faculty for the degree of Master of Arts, the student must, while residing at the University, complete six full courses in addition to the twenty-four required for the degree of Bachelor of Arts, and must present a satisfactory thesis to the Faculty.

2. To obtain the recommendation of the Faculty for the degree of Master of Science, the student must, while residing at the University, complete four full courses in addition to the twenty-six required for the degree of Bachelor of Science, and must present a satisfactory thesis to the Faculty. The choice of at least three of the four courses, and the subject of the thesis are limited to the physical and biological sciences.

3. To obtain the recommendation of the Faculty for the degree of Master of Philosophy* the student must, while residing at the University, complete four full courses in addition to the twenty-six required for the degree of Bachelor of Philosophy, and must present a satisfactory thesis to the Faculty.

4. To obtain the recommendation of the Faculty for the degree of Master of Letters the student must, while residing at the University, complete four full courses in addition to the twenty-six required for the degree of Bachelor of Letters, and must present a satisfactory thesis to the Faculty.

5. A student may be recommended for a Master's degree without having taken the Bachelor's degree, provided he give notice of such a purpose at least one year before he applies for the degree, and choose courses which are approved by the Faculty, and present a satisfactory thesis to the Faculty.

6. Bachelors of Arts, Bachelors of Science, Bachelors of Philosophy, and Bachelors of Letters, graduates of the University, who have not resided here since graduation, but who at a date not earlier than two years after graduation shall, on examination, show special proficiency in literary or scientific studies, and present a satisfactory thesis to the Faculty, will

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*This degree will not be conferred after 1881. In its place the degree of Master of Letters will be bestowed.

be recommended respectively for the degrees above described, (1, 2, 3, 4.)

7. The degree of Doctor of Philosophy is open to the graduates of the University, or of any other reputable University or College, who shall have satisfied the Faculty on examination that they have made special proficiency in some one branch of study, and good attainments in two other branches to be specified by the Faculty. They will be expected to reside here, and to perform an amount of work which will occupy at least two years. It is intended that the degree of Doctor of Philosophy shall not be won merely by faithful and industrious work in some assigned course of study, but that the successful candidate shall evince power of original research, and of independent investigation.

Persons who are not graduates will be received as candidates for this degree, if they satisfy the Faculty that they have made attainments equivalent to those required here for the degree of Bachelor of Arts, Bachelor of Philosophy, or Bachelor of Science.

STUDIES, ATTENDANCE AND DISCIPLINE.

Without special permission of the Faculty no student can drop any course of study until he shall have attended the regular examinations in the same.

Such delinquencies as tardiness, absence, deficiencies, offenses against good order, in the several departments of instruction, are ordinarily dealt with by the Professor in charge of the department in which they occur. Flagrant cases are reported to the faculty for adjudication.

Students who are not in their places at the opening of the semester must present written excuses from their parents or guardians for the delay.

Students are not allowed to absent themselves from town withont permission of the President.

The State of Michigan extends the privileges of the University, without charge for tuition, to all persons of either sex, who are qualified for admission. Thus it does not receive patronage, but is itself the patron of those who seek its privileges and its honors. It cannot, however, be the patron of idleness or dissipation. Its crowded classes have no room except for those who assiduously pursue the studies of their choice, and are willing to be governed in their conduct by the rules of propriety.

Students are suspended or dismissed, whenever, in the opinion of the Faculty, they are pursuing a course of conduct seriously detrimental to themselves or the University.

The following are extracts from the by-laws of the Regents:

"Concerted absence from any appointed duty by a class or any number of students together, will be regarded as a great violation of good order, and will be followed by suspension or dismission, at the discretion of the Faculty."

"Whenever any Faculty is satisfied that a student is not fulfilling, or likely to fulfill, the purpose of his residence at the University, or is for any cause an unfit member thereof, the President shall notify his parents or guardians, that they may have an opportunity to withdraw him, and if not withdrawn within a reasonable time he shall be dismissed."

The Polytechnic School.

The University has for years given advanced instruction in the mathematical, physical and natural sciences, and thorough courses in the practical application of these sciences to the arts. We have now given to the different branches of such work a closer grouping, a more compact organization, and an ampler development, and have recognized by name what we have already had in fact, The Polytechnic School. It comprises the work in Civil Engineering, the School of Mines, Advanced Course in Science, and the School of Pharmacy,

The work is arranged with reference to the wants of two classes of students:

First, Those pursuing the study of Civil or Mining Engineering, or the Study of Pharmacy (which includes an extended course in Analytical Chemistry) with the view of graduating.

Secondly, Graduates of Colleges and other persons qualified for advanced or special study of Mineralogy, Geology, Zoölogy, Botany, Civil or Mining Engineering, Physics, Analytical and Applied Chemistry, Pharmacy or Metallurgy.

In the Museum of Scientific Collections with its specimens, in the spacious and well-appointed Chemical, Microscopical and Mineralogical Laboratories, in the Engineering Instruments and Models, in the Architectural Collection, and in the apparatus of the several departments of science, large facilities for illustrative teaching and study are furnished.

The general scope of the work and of the advantages offered for it is indicated in the descriptions which follow:

I. CIVIL ENGINEERING.

The University aims, by the course of study pursued in the department of Civil Engineering, to lay a foundation of sound theory, sufficiently broad and deep, to enable its graduates to enter understandingly on the further investigation of the several specialities of the profession, and at the same time to impart such a knowledge of the usual practice of an office, and of an engineering party, as shall make its students useful in any position to which they may be called. While the adaptation of theory to practice can be thoroughly learned only by the training of experience, there are many matters in which the routine of work of an engineering field party, office or drafting room can be carried out on a greater or less scale. In all such particulars the civil engineering course of the University will embody as close an imitation of the requirements of active labor as the instructors who have the several branches in charge can devise. All the technical branches are under the direct care of those who have had professional experience as well as a full scientific training. How the above objects are attained will be seen below.

Upon a successful completion of *twenty-four Full Courses*, including the required studies specified hereafter, and the presentation of a satisfactory thesis, with accompanying drawings, the student will receive the degree of Bachelor of Science (after 1881) in the Department of Civil Engineering. Students who are not candidates for a degree may pursue such studies as they prefer, provided they are found prepared to join the classes in those studies. They will be expected to attend all the lectures, recitations and examinations in those branches prescribed for the regular students, and will be required to take enough work to occupy them profitably. The time requisite for a careful and thorough preparation for the profession is not specified by the University; any student of ordinary diligence may complete all the work within four years. A second degree of Civil Engineer, will be conferred upon candidates, after a sufficient interval of study and actual work; the precise conditions for obtaining it have not yet been definitely determined.

Bachelors of Arts, of Letters, and of Science of this University, and graduates of other Colleges, whose courses of study are equivalent to ours, are admitted to the same degree with the regular students after attendance on, and a satisfactory examination in, the technical subjects alone of this course as set forth in the schedule on the following pages, in addition to the Higher Mathematics, and Analytical Mechanics, there specified. These studies can be completed in two years. The culture imparted by classical or other liberal training will be found to have its uses for one engaged in the engineering work, and the previous discipline of the faculties in exact research will enable the professional student to master more easily the requirements of the course. All the time which the student can devote to general studies before taking up specialities will be well spent.

The work in surveying combines theory and practice as follows:—A course of lectures and text-book work, in daily exercises, covers so much of one year as is not given to field work; all the operations of surveying, laying out work and computing, as well as the theory of instruments, are explained in detail. Every student is afforded abundant opportunity of becoming familiar, by actual use, with the excellent and full assortment of instruments owned by the University, embracing those usually employed in actual work, and numbering enough to equip well the parties. The classes in surveying are drilled in all the field work that pertains to that branch of engineering; they make surveys, traverse them, calculate contents, divide areas, and solve problems in heights and distances, from data taken by the members themselves. They also determine the meridian and take observations for latitude. This work is done during the fall months; the finished plans of the surveys are made during the winter.

The classes in railroad engineering have practice in running levels and curves of different kinds, and in the measurement of earthwork. They are also, in the month of June, taken into the field as a railroad party, under competent supervision, for a space of four weeks continuously, when they go through all the field work for a projected line; reconnoisance, preliminary and location surveys, cross-sectioning, staking out, contouring and topography, doing all the work up to the point of actual construction. A plan and profile, carefully made in the field by each student from the notes of the party, completes this portion of the subject, and serves to fix the practical application of the principles obtained from the text-books and lectures. In the above work is usually included a plane-table survey, triangulation, and some hydrography, when the selected locality is favorable.

A course of instruction, by text-books and lectures, is given in Analytical Mechanics, the work being shaped especially for the needs of engineering students.

The study of the Strength of Materials and the Theory of Construction covers a course of recitations and lectures for an entire year. The text-book used is Rankine's Manual of Civil Engineering, supplemented with full explanations, additional lectures, examples and problems. A complete course of instruction is also given in the Graphical Analysis of Roof and Bridge Trusses and Arches, as recently developed and applied. The student is made familiar with both the analytical and graphical methods of treatment, and thus possesses ready proof of the accuracy of his calculations.

Contemporaneously with this course of study the class are required to work out problems in Engineering Design, or the application of the theory to actual cases. The students are furnished with the usual data for a design, and the kind or type of structure is indicated. They are then expected to make the necessary calculations for proportioning the different parts, and to present, at a specified date, complete working drawings, giving full details and figured dimensions, accompanied by bills of materials. The graphical method is applied to each problem.

A very complete course of Mechanical Drawing, with kindred studies, is also given. It embraces, first, Plane Projection Drawing and the elementary principles of coloring, shading, isometric projection, etc.; next, Descriptive Geometry, with original problems executed in the drawing room, followed by

Free-hand Drawing, Topographical Drawing, Ornamentation and Lettering, Shades and Shadows, Linear Perspective and Drawing for Stone-Cutting. Lectures are given on Pure Mechanism, with work in drawing parts of machines. Examples from numerical data are always given in all branches and copying from the flat is avoided. The plans of surveys, plane-table work, maps, designs in engineering construction, and finally the Thesis Drawings, naturally come under this head, and all together give work in the drawing rooms almost daily throughout the course.

Finally a course of lectures is given upon the principles of Machine Construction, and upon the action of Turbines and other Water Wheels, the Steam Engine, etc.

The instruction is illustrated by models, drawings, photographs, lithographs, etc., including trusses, arches, details of construction, in iron, wood and stone, shapes of iron, working models of turbines, engines, etc., working drawings of a number of bridges, etc. These collections are receiving additions from year to year, by gifts and purchase, and are invaluable to the student. The latest and best books on professional subjects are added yearly to the library, where they are accessible to all, and frequent references are made to them in the class-room, as the various subjects are brought forward.

Examinations, usually written, are held at the end of each semester, but, at any time, without previous notice, the classes may be examined on any portion of their previous work, to test their actual knowledge.

For *Requirements for Admission*, see p. 25.

COURSES OF STUDY.

The courses of study required for graduation in the Department of Civil Engineering are as follows, the technical branches being printed in SMALL CAPITALS.

Mathematics.—Courses 1, 2, 3, 5, 6; Part III. of Olney's Algebra, or an equivalent in other authors; Part III. of Olney's Geometry; Plane and Spherical Trigonometry; General Geometry, including Loci in Space; Differential and Integral Calculus.

Analytical Mechanics.—Civil Engineering Course 7; Wood's Analytical Mechanics, with Lectures.

CIVIL ENGINEERING.—Courses 1, 2, 4, 8, 9; Rankine's Civil Engineering, Parts II. and III., and Lectures; Resistance of Materials and Theory of Structures; Principles of Stability and Strength; Beams, Trusses, Girders; Roofs and Bridges in Wood and Iron; Arches in Stone and Iron; Earthwork, Masonry, Retaining Walls, Foundations, Tunnels.

Flow and Distribution of Water; Sanitary and Hydraulic Engineering; Drainage and Sewerage, Canals and Tidal Works.

Engineering Design; Original Problems and Designs for Roofs, Bridges, and Structures of Wood, Iron and Stone; Working and Detail Drawings; Bills of Material, Diagrams and Strain Sheets.

[The above courses will necessarily be taken nearly in the order of enumeration.]

DRAWING.—Courses 1, 2, 4, 5, 6; Civil Engineering Course 10; Geometrical Drawing; Plane Projection, Isometric Projection; Use of India Ink and Water Colors; Free-hand Drawing, Pen and Ink Drawing; Descriptive Geometry, with Problems; Topographical Drawing; Ornamentation and Lettering; Shades and Shadows, Linear Perspective; Stereotomy.

MACHINERY AND PRIME MOVERS.—Civil Engineering Courses 5, 6; Lectures on Principles of Mechanism; Machine Drawing from Models and Machinery; Lectures on Theory and Construction of Machines; Water Wheels; Steam Engines.

[The above courses, also, must practically conform to the given order. The order of the courses which follow is left to the discretion of the student, subject to the restrictions found on pp. 25-29.]

SURVEYING.—Courses 1, 2, 3, 4; Theory and Adjustment of Level, Transit, Compass, Solar Compass, Plane Table and Sextant; Henck's Field-book for Engineers; Rankine's Civil Engineering; Leveling, Topography, Staking out Work, Computation of Quantities, Preparation of Estimates; Field Practice; Drawing of Plans, Maps and Profiles.

ASTRONOMY.—Course 3; Spherical and Practical Astronomy; Computation of Time, Latitude and Longitude.

GRAPHICS OF STRUCTURES.—Civil Engineering Course 3; Stress Diagrams and Graphical Methods of Analysis; Greene's Trusses and Arches; Part I., Roof Trusses; Part II., Bridge Trusses; Part III., Arches.

French.—Courses 2, 6.—Grammatical Analysis; Translation into English and French.

German.—Courses 1, 3.—Whitney's Grammar, Exercises and Reader.

English.--Courses 1 and 2 or 8.—English Grammar and Rhetoric; Theory and Practice.

Physics.—Course 2.—Mechanics, Acoustics and Optics; Experimental Lectures and Text-book.

Chemistry.—Course 2.—Elementary Chemistry, Heat, Electricity and Magnetism; Experimental Lectures and Class-room Work.

Mineralogy and Geology.—Courses 1, 5.—Mineralogy and Lithology; Dynamical and Structural Geology.

The studies just enumerated make *twenty-one Full Courses*, as defined on p. 42. From the other courses offered the candidate for a degree must choose and complete *three Full Courses*, making *Twenty-four Full Courses* in all: and he must also prepare a satisfactory thesis. It is suggested that this additional work, and such other extra work, if any, as the student's ability and length of residence may warrant his undertaking, shall be chosen from studies which will strengthen the *required* courses, rather than introduce new branches.

ADVANCED STUDIES.

An advanced course of study is offered to graduates of the Civil Engineering Course and to Resident Graduates. It will consist of:

CIVIL ENGINEERING.—Further investigations of the Theory of Construction, more especially in the direction of Continuous Girders, Revolving Draw-Spans, Rigid and Braced Arches, etc.

Also a more extended course on the Steam Engine and other Prime Movers.

PROJECTS IN ENGINEERING.

MATHEMATICS.—Calculus of Variations.

ASTRONOMY.—*Theoretical Astronomy.*—Numerical Calculus, Theory of Interpolation and Quadratures, Method of Least Squares. Calculation of the special and general Perturbations of Planets and Perturbations of Comets.

PHYSICS.—Work in Physical Laboratory and Mathematical Theory of Light and Sound. Heat, Electricity and Magnetism.

CHEMISTRY.—Qualitative and Quantitative Analysis.

MECHANICAL ENGINEERING.

While no course of instruction looking to this profession has been established, the greater part of the studies prescribed for the students in Civil Engineering will be found needful by those students in Selected Studies who may wish to devote especial attention to this branch. The instruction akin to Mechanical Engineering is: Pure Mechanism, or the General Principles of Machinery, including Gearing, Cams, Screws, Cranks and Levers, with Problems and Machine

Drawing; also lectures upon the Prime Movers, Water Wheels and the Steam Engine. Students in Selected Studies may also take up Rankine's "Machinery and Millwork," and Rankine's "Steam Engine and Other Prime Movers," a more extended course than is pursued by the other classes. They may also have practice in the Chemical Laboratory in Qualitative and Quantitative Analysis, with special reference to the Metallurgy of Iron and Steel.

II. SCHOOL OF MINES.

At the session of the State Legislature of 1875, an act was passed to provide for the establishment of a School of Mines at the University. In this act provision was made for the appointment of a Professor of Mining Engineering, and a Professor of Metallurgy, with the necessary assistant instructors. A liberal appropriation was also made for the purchase of special apparatus and for the general equipment of the school. In compliance with this act of the Legislature, the school was opened for the reception of students in September, 1875, and steady progress has been made in the fitting up of the metallurgical laboratory, and in securing the necessary appliances for imparting the highest theoretical and best practical instruction possible.

The requirements for admission to this school are given on page 25. Students may be admitted to advanced standing, if properly qualified, at the beginning of any semester. Special students, not candidates for a degree may also be allowed to pursue such of the technical studies taught in the school, as they may choose, provided they are found prepared to join the classes in those studies.

The requirements for graduation are the successful completion of the twenty-four Full Courses specified on page 43, and the presentation of a satisfactory thesis upon some topic connected with mining or metallurgy. Those students who complete the requirements prior to the annual Commencement in 1881 will receive the degree of Mining Engineer. After the year 1881 the degree of Bachelor of Science will be given, the diploma indicating the fact that the graduate has completed the requirements of this school.

Nearly two-thirds of the studies pursued in this school are the same as those in the Department of Civil Engineering; but in the latter part of the course the chief attention is directed to the subjects of Chemistry, Mineralogy and Geology, with their applications to Mining, Metallurgy and Assaying. For details relating to the branches pursued in common in the two departments, reference may be made to the remarks found in the preceding pages, under the head of Civil Engineering.

The elements of *Chemistry*, in connection with the phenomena of heat, electricity and magnetism, are taken up by lectures and recitations, before the analytical work in the Chemical Laboratory is begun. For information as to the character of the work in the Laboratory, see pp. 63-64.

The course in *Mineralogy* and *Lithology* is made thorough and practical. The first subject in order is Crystallography, which is fully illustrated by means of sciopticon projections and by a large collection of wooden models, with which each student will be obliged to make himself familiar. A set of over sixty glass models, imported from Germany, adds materially to the facilities of instruction in this branch of the subject. Following Crystallography, the other physical properties of minerals, such as hardness, lustre, diaphaneity, color and structure, are taken up in turn, and the student is made familiar with their relative importance as means of identifying mineral species. Special descriptive Mineralogy comes next, and the more important species of minerals will be studied in detail, with constant reference to Dana's System of Mineralogy. Upon the completion of the descriptive portion of the subject, the study of Lithology is pursued in a similar manner, necessitating a constant application of the knowledge gained in the preceding part of the course.

The mineralogical cabinet contains about 6,000 specimens, embracing all the varieties of iron, copper and silver ores and their associated minerals from the different localities of the

Lake Superior mining district, as well as rare collections from other States and from foreign lands. In addition to the large cabinet, a working collection of nearly a thousand specimens of the more common minerals, ores, and rocks in all their varieties and groupings is freely accessible to the students for study and practice, under suitable restrictions to prevent any unnecessary damage to the specimens.

Upon the completion of the course in *Mineralogy and Lithology* the subject of *Geology* is taken up, and taught by lectures, recitations, and the free use of the extensive geological collections belonging to the University. See pp. 14 and 15. Particular attention is paid to the geology of mines and mineral districts, and to the modes of occurrence of mineral substances which have an economical or commercial importance. Paleontology is taught so far as to enable the student to recognize the leading American fossils. The several State Geological Reports are referred to for details relating to the mineral wealth of the country, and the methods and objects of geological surveys will be explained.

In *Mining Engineering* the instruction is given mainly by lectures. The machines in use at the best mines are described, and the mutual relations of parts explained and illustrated with the aid of plates and diagrams; and the different operations connected with the discovery, opening, development, and working of mines are studied in their proper order. Models of mines and mining machinery will be accumulated as rapidly as circumstances admit. A very valuable model of a stamp mill has been given to the University by the Calumet and Hecla Mining Company.

The facilities for instruction in *Metallurgy* are of a very high grade. Instruction is given by means of an extensive course of lectures and recitations upon the more theoretical aspects of the subject, and by a thorough drill in the fundamental principles upon which all successful smelting operations have to be conducted. A large and convenient Metallurgical Laboratory has been recently fitted up in connection with the Chemical Laboratory. It contains already a small Blake crusher, a California stamp mill with two stamps driven by steam power, four cupel furnaces, four large wind furnaces, a lathe and a blacksmith's forge and anvil. A large quantity of ores and furnace products has been obtained from the Wyandotte Silver Smelting and Refining Company, and from Colorado, to which additions will be made from time to time. The ores of the Lake Superior region will always be fully represented. In this Laboratory the subject of assaying can be taught with great advantage.

The formation of a metallurgical and industrial cabinet will also be made an important duty in connection with this department. A model collection of iron ores and furnace products has been received for this collection from Cincinnati, and a set of over 250 specimens, illustrating the iron and copper industries of the Lake Superior region, has lately been sent from Philadelphia, being a part of what was displayed at the Centennial Exhibition. It is hoped that numerous contributions will be made to this cabinet from friends of the University and of this School.

COURSES OF STUDY.

The regular courses of study required for graduation in this School are as follows:

Mathematics.—Courses 1, 2, 3, 5, 6.

French.—Courses 2, 6.

German.—Courses 1, 3.

English.—Courses 1, either 2 or 8.

Physics.—Course 2.

General Chemistry.—Course 2.

[The above courses are the same as in the Department of Civil Engineering.]

Analytical Chemistry.—Courses 1, 2, 4, 7, 8.—Qualitative and Quantitative Analysis, including Assaying and Blow-pipe Analysis. See page 64.

Mineralogy.—Course 2.—Lectures; Dana's Works on Mineralogy; Von Cotta and Lawrence's Lithology; Systematic Practice in determining Minerals and Rocks by means of their physical properties.

Geology.—Courses 2, 3.—Dana's Manual of Geology; Lectures; Economic Geology; Phenomena of Veins and Mineral Deposits; Prime's translation of Von Cotta's Treatise on Ore Deposits; Special Geology of Mining Districts; Paleontology.

Astronomy.—Course 2.—Lectures.

Drawing.—Courses 1, 4, 6.—Geometrical Drawing: Descriptive Geometry; Free-hand Drawing. See also page 38.

Surveying.—Courses 1 and 4. These comprise a portion of the work in Surveying completed by Students in Civil Engineering. See page 38. The field work in June is included.

Civil Engineering.—Courses 1, 2, 5, 6, 7.—These comprise Analytical and Applied Mechanics; Resistance of Materials and Theory of Structures; Machinery and Prime Movers; Mechanism and Machine Drawing. See also page 39.

Mining Engineering.—Course 1.—Lectures, with constant reference to standard works; Explorations, Boring, Shaft-sinking, Tunneling, Laying out of Mines, Excavating, Transportation, Hoisting, Ventilation, Drainage and Pumping, the Water-supply, Treatment of Fires in Mines, Ore Dressing, and the elucidation of the principles involved in each case, Mine Surveying with practice upon Problems and in Platting; study of plans and sections of Mines.

Metallurgy.—Course 1.—Lectures, with frequent reference to the works of Percy, Kerl, Phillips, and others. Principles of Smelting, Fuels, Furnace Construction; Fire-proof Materials; problems in Calorific Power and Calorific Intensity; Slags; Special Processes for Copper, Lead, Silver, Gold; Metallurgy of Iron; Varieties of Iron and Steel; treatment of Ores containing Arsenic, Antimony, Nickel, Cobalt, Bismuth, Tin, and other Metals.

Elective.—In addition to the above studies, one Full Course is to be elected by the student.

ARCHITECTURE AND DESIGN.

The formal instruction in Architecture and Design which was begun in 1876, is suspended in consequence of the curtailment of the resources of the University. But it is hoped that at no distant day this instruction may be resumed.

III. SPECIAL AND ADVANCED COURSES IN SCIENCE.

I. MINERALOGY AND GEOLOGY.

The *general* course in these two sciences covers nearly two semesters, during which the students attend the same exercises as those of the undergraduates, with the addition of special practice hours.

Advanced students or those who have completed the general course, will be furnished with the requisite facilities for a further prosecution of their studies in connection with the special course in Paleontology, or with the classes in the School of Mines.

II. ZOÖLOGY.

For Courses offered in Zoölogy see page 37. Special and advanced students will be allowed to elect any of the Courses described, or, if too far advanced to receive profit from these, will be given special work.

III. BOTANY.

Special courses in Botany are given during both semesters. They are offered to students who have already completed the elementary course in Structural and Physiological Botany.

In the first semester a course of lectures is given on the special Morphology of Plants. A practical study of the leading groups of cryptogamic plants, with observations of their anatomy and physiology is carried on in the Microscopical Laboratory. Special attention is paid to the study of Fungi, and their relations to other plants, and original investigation in this direction is encouraged as much as possible.

Sachs's "Text book of Botany," DeBary's "Morphologie und Physiologie der Pilze," Cooke's "Hand-book of the British Fungi," an edition of Gray's Manual of Botany, containing the Mosses and Hepaticæ, Sullivant's "Icones Muscorum," and Hooker and Baker's "Synopsis Filicum," are among the most important works of reference.

In the second semester an advanced course in Structural and Physiological Botany is pursued. Lectures are given accompanied by experimental work and theses on the part of the student. The plan of work this year will be essentially that indicated in Sachs's "Hand-buch der Experimental Physiologie." In addition to the text-books of Sachs, Johnson's "How Plants Grow" and "How Plants Feed" are recommended for reference.

These courses will be made as practical as possible. For this purpose the student will be expected to apply for a table in the Microscopical Laboratory, where all the necessary materials, microscopes, and other instruments will be provided at a cost only sufficient to cover actual expenses on the part of the University.

Instruction is given in Practical Microscopy, the use of Micro-Chemical Reagents, and other methods of observation, in drawing and measuring from the microscope, etc. The Microscopical Laboratory is open every morning from 8½ to 12½ o'clock. The charge for the use of Microscopes, other instruments and materials, is at present fixed at two dollars for each semester or fraction of a semester, which amount must be deposited by each student with the Treasurer of the University before his application for a table can be entered. Students are responsible for the apparatus furnished them, and are required to make good any injury to the instruments under their charge.

Among the works of reference to be used in the Laboratory are Carpenter's "Microscope," the "Micrographic Dictionary," Schacht's "Mikroskop und seine Anwendung," Flückiger and Hanbury's "Pharmacographia," Berg's "Anatomischer Atlas," etc.

The Botanical Course in the School of Pharmacy is described in the chapter devoted to that School.

IV. PHYSICS.

The study of Experimental Mechanics, Acoustics and Optics, is taken up daily during the first semester. The text-book, Deschanel's "Natural Philosophy," is largely supplemented by lectures and experiments, on all of which regular recitations are had. Heat and Electricity are taken up in the second semester in connection with General Chemistry.

A shorter course in Physics is also offered, requiring attendance at two lectures and one recitation weekly. Deschanel's "Natural Philosophy," or Ganot's "Physics," are recommended as reference books for those who take the shorter course.

Under an appropriation of the last Legislature a Physical Laboratory was opened during the past year. The rooms devoted exclusively to the Department of Physics extend in a direct line over 125 feet, and are lighted from the North, East, and South, and provided with steam, gas and water.

Here a systematic course in physical measurements is provided; such a course as will give the student familiarity with apparatus and its manipulation, a clearer understanding of the methods by which the important tables of the text-book have been made out, and confidence in their accuracy. For this purpose apparatus has been provided for the accurate determination of weights and measures, linear and cubic, of specific gravity, elasticity of bodies, strength and stiffness of beams, and simple structures as trusses, bridges, etc.; for the flow of liquids and gases, for many measures of rates of vibration of sounding bodies, of the index of refraction in solids and liquids, of wave length of lines in the solar spectrum, and in the spectrum of common materials, of the intensity of light, and of the amount of light absorbed by various shades, etc.; of the strength of galvanic batteries, and the resistance of conductors, of specific and latent heat, etc., etc.

The plan followed is in the main the one developed through many years of successful operation at the Massachusetts Institute of Technology, modified as may be necessary to meet the wants of advanced or special students. Pickering's "Elements of Physical Manipulation" is used as a text book. It is, of course, understood that in this course the students perform all the experiments themselves.

As the schedule is at present arranged, work in the Laboratory comes in the second semester, and follows naturally on the text-book work of the first; there will then remain time during the college course for advanced or original work if the student desires it.

Those desiring to become familiar with the ordinary apparatus and lecture experiments can also be accommodated to a considerable extent.

In case a sufficient number of students who expect to teach desire it, during the spring a short course of lectures will be given, illustrated by such easy experiments as can be repeated in any school with little trouble, and at a very trifling expense. No examination will be required in connection with this course, (Course 6 of the Announcement.)

No extra fees are required for any of the work in Physics.

V. PURE MATHEMATICS.

The description of the work in Pure Mathematics will be found on page 31.

VI. ASTRONOMY.

The course in Higher Astronomy embraces two years. The following subjects give direction to the lectures of the course:

Formation of the Fundamental Equations of Motion. Integration of the Equations for Undisturbed Motion, and Determination of the Elements of the Orbit. Theory of Interpolation. Calculation of Ephemerides.

Calculation of the Orbits of the Celestial Bodies from Three or more Observations. Correction of the Elements. Combination of Observations by the method of Least Squares. Special and General Perturbations. Determination of Time, Latitude and Longitude.

Theory of the Instruments.

During the course the student has access to the instruments of the Observatory, under the special direction of the Professor, and is permitted to take part in the observations.

VII. MODERN LANGUAGES.

Large facilities are furnished for the study of the Modern Languages, with reference to the oral use of them, or to the reading of foreign treatises on science. A detailed description of the work is found on page 31.

VIII. CHEMISTRY.

The preparation for giving instruction in General Chemistry, Chemical Physics, Analytical and Applied Chemistry, Metallurgy and Pharmacy, are most ample and complete. The lecture-room in Chemical Physics and General Chemistry will accommodate nearly five hundred students, and is arranged with elevated seats, having special reference to experimental illustration. The lectures are illustrated by the use of a large collection of the most approved apparatus, covering the subjects of Heat, Spectrum Analysis, Electricity and General Chemistry. The use of the lantern, of the most approved construction, lighted by the calcium light of electric discharge, enables the Professor to exhibit delicate experiments upon the screen, so as to be seen by a large audience. These lectures are made as practical, in the ordinary affairs of life, as strict science will permit. The instruction in Metallurgy is illustrated by the use of a rare and expensive collection of furnace models constructed upon an accurate scale; embracing models for the smelting of Iron and Copper, Lead, Silver, Zinc, and for the manufacture of Steel and Glass.

The Laboratory of Analytical and Applied Chemistry occupies a ground space of 15,000 square feet, and contains six work-rooms devoted to different branches of experimental study, furnishing in all one hundred and seventy-five students' tables. Each table is supplied with gas, water, and wash-basin, and waste-pipe, and with suitable apparatus. Each student has an average area of fifty-five square feet, and an air space of eight hundred cubic feet. The Laboratory is furnished with sand, water and steam baths, drying ovens and exhaust connections for filtration. In the balance room, chemical balances are separately assigned to the students in quantitative work, and microscopes are provided in the microscopic room for branches of chemical work requiring these instruments. The general furnace room (30 by 100 feet) contains assay furnaces, and apparatus for ultimate organic analysis. The standard works of reference for Chemistry and the allied sciences are kept accessible to the students. The Laboratory rooms are well ventilated by Sturtevant fan ventilators.

Expenses of the Laboratory.—It is the design of the Regents that the chemicals and apparatus actually consumed in the individual manipulations of the student shall be paid

Drawing; also lectures upon the Prime Movers, Water Wheels and the Steam Engine. Students in Selected Studies may also take up Rankine's "Machinery and Millwork," and Rankine's "Steam Engine and Other Prime Movers," a more extended course than is pursued by the other classes. They may also have practice in the Chemical Laboratory in Qualitative and Quantitative Analysis, with special reference to the Metallurgy of Iron and Steel.

II. SCHOOL OF MINES.

At the session of the State Legislature of 1875, an act was passed to provide for the establishment of a School of Mines at the University. In this act provision was made for the appointment of a Professor of Mining Engineering, and a Professor of Metallurgy, with the necessary assistant instructors. A liberal appropriation was also made for the purchase of special apparatus and for the general equipment of the school. In compliance with this act of the Legislature, the school was opened for the reception of students in September, 1875, and steady progress has been made in the fitting up of the metallurgical laboratory, and in securing the necessary appliances for imparting the highest theoretical and best practical instruction possible.

The requirements for admission to this school are given on page 25. Students may be admitted to advanced standing, if properly qualified, at the beginning of any semester. Special students, not candidates for a degree may also be allowed to pursue such of the technical studies taught in the school, as they may choose, provided they are found prepared to join the classes in those studies.

The requirements for graduation are the successful completion of the twenty-four Full Courses specified on page 43, and the presentation of a satisfactory thesis upon some topic connected with mining or metallurgy. Those students who complete the requirements prior to the annual Commencement in 1881 will receive the degree of Mining Engineer. After the year 1881 the degree of Bachelor of Science will be given, the diploma indicating the fact that the graduate has completed the requirements of this school.

Nearly two-thirds of the studies pursued in this school are the same as those in the Department of Civil Engineering; but in the latter part of the course the chief attention is directed to the subjects of Chemistry, Mineralogy and Geology, with their applications to Mining, Metallurgy and Assaying. For details relating to the branches pursued in common in the two departments, reference may be made to the remarks found in the preceding pages, under the head of Civil Engineering.

The elements of *Chemistry*, in connection with the phenommena of heat, electricity and magnetism, are taken up by lectures and recitations, before the analytical work in the Chemical Laboratory is begun. For information as to the character of the work in the Laboratory, see pp. 63-64.

The course in *Mineralogy* and *Lithology* is made thorough and practical. The first subject in order is Crystallography, which is fully illustrated by means of sciopticon projections and by a large collection of wooden models, with which each student will be obliged to make himself familiar. A set of over sixty glass models, imported from Germany, adds materially to the facilities of instruction in this branch of the subject. Following Crystallography, the other physical properties of minerals, such as hardness, lustre, diaphaneity, color and structure, are taken up in turn, and the student is made familiar with their relative importance as means of identifying mineral species. Special descriptive Mineralogy comes next, and the more important species of minerals will be studied in detail, with constant reference to Dana's System of Mineralogy. Upon the completion of the descriptive portion of the subject, the study of Lithology is pursued in a similar manner, necessitating a constant application of the knowledge gained in the preceding part of the course.

The mineralogical cabinet contains about 6,000 specimens, embracing all the varieties of iron, copper and silver ores and their associated minerals from the different localities of the

Lake Superior mining district, as well as rare collections from other States and from foreign lands. In addition to the large cabinet, a working collection of nearly a thousand specimens of the more common minerals, ores, and rocks in all their varieties and groupings is freely accessible to the students for study and practice, under suitable restrictions to prevent any unnecessary damage to the specimens.

Upon the completion of the course in *Mineralogy and Lithology* the subject of *Geology* is taken up, and taught by lectures, recitations, and the free use of the extensive geological collections belonging to the University. See pp. 14 and 15. Particular attention is paid to the geology of mines and mineral districts, and to the modes of occurrence of mineral substances which have an economical or commercial importance. Paleontology is taught so far as to enable the student to recognize the leading American fossils. The several State Geological Reports are referred to for details relating to the mineral wealth of the country, and the methods and objects of geological surveys will be explained.

In *Mining Engineering* the instruction is given mainly by lectures. The machines in use at the best mines are described, and the mutual relations of parts explained and illustrated with the aid of plates and diagrams; and the different operations connected with the discovery, opening, development, and working of mines are studied in their proper order. Models of mines and mining machinery will be accumulated as rapidly as circumstances admit. A very valuable model of a stamp mill has been given to the University by the Calumet and Hecla Mining Company.

The facilities for instruction in *Metallurgy* are of a very high grade. Instruction is given by means of an extensive course of lectures and recitations upon the more theoretical aspects of the subject, and by a thorough drill in the fundamental principles upon which all successful smelting operations have to be conducted. A large and convenient Metallurgical Laboratory has been recently fitted up in connection with the Chemical Laboratory. It contains already a small Blake crusher, a California stamp mill with two stamps driven by steam power, four cupel furnaces, four large wind furnaces, a lathe and a blacksmith's forge and anvil. A large quantity of ores and furnace products has been obtained from the Wyandotte Silver Smelting and Refining Company, and from Colorado, to which additions will be made from time to time. The ores of the Lake Superior region will always be fully represented. In this Laboratory the subject of assaying can be taught with great advantage.

The formation of a metallurgical and industrial cabinet will also be made an important duty in connection with this department. A model collection of iron ores and furnace products has been received for this collection from Cincinnati, and a set of over 250 specimens, illustrating the iron and copper industries of the Lake Superior region, has lately been sent from Philadelphia, being a part of what was displayed at the Centennial Exhibition. It is hoped that numerous contributions will be made to this cabinet from friends of the University and of this School.

COURSES OF STUDY.

The regular courses of study required for graduation in this School are as follows:

Mathematics.—Courses 1, 2, 3, 5, 6.

French.—Courses 2, 6.

German.—Courses 1, 3.

English.—Courses 1, either 2 or 8.

Physics.—Course 2.

General Chemistry.—Course 2.

[The above courses are the same as in the Department of Civil Engineering.]

Analytical Chemistry.—Courses 1, 2, 4, 7, 8.—Qualitative and Quantitative Analysis, including Assaying and Blow-pipe Analysis. See page 64.

Mineralogy.—Course 2.—Lectures; Dana's Works on Mineralogy; Von Cotta and Lawrence's Lithology; Systematic Practice in determining Minerals and Rocks by means of their physical properties.

Geology.—Courses 2, 3.—Dana's Manual of Geology; Lectures; Economic Geology; Phenomena of Veins and Mineral Deposits; Prime's translation of Von Cotta's Treatise on Ore Deposits; Special Geology of Mining Districts; Paleontology.

in the chemical laboratory, is used by the class in study for the recitations. Text-book, H. C. Wood's Materia Medica. Examination, at the close of the year.

9. *Pharmacy.*—First, of *inorganic* materials and the technical history of chemical wares, by lectures and recitations, from works of reference and from laboratory work, until the Christmas vacation. Second, of *organic* chemistry and materials, lectures, and recitations from Proximate Organic Analysis, until the week before the June Commencement. For the first six months of the term, three times a week; for the last three months of the term, five times a week.

10. *Organic Analysis.*—Verification of the reactions of carbon compounds in a series of known mixtures; (2) Qualitative Analysis of a series of organic mixtures; (3) Quantitative estimation of organic drugs. Text-book, Prescott's Proximate Organic Analysis.

11. *Toxicology.*—Analysis of food material or tissue material in assumed cases of poisoning and in cases instituted with animals,—including the chief inorganic and organic poisons. Lectures are given with the laboratory work. Reference is made to the works of Otto, Wormley, Reese, Taylor, Woodman and Tidy.

12. *Analysis of Urine.*—Normal and abnormal, by qualitative, volumetric and microscopical methods. Text-book, Vaughan. Reference to the works of Hassall, Beal, Thudicum, Burdon-Sanderson. The examination is held on completion of a course of lectures on this subject.

13. *Pharmacopœial Preparations.*—Exercises in each class, U. S. Pharmacopœia; in some of the more elaborate chemical productions; in the minor performances of extemporaneous pharmacy, and in reading and preparing prescriptions. Use of the U. S. Pharmacopœia with reference to the U. S. Dispensatory. The student derives advantage from ready access to Parrish's Pharmacy, and to Wittstein's Pharmaceutical Chemistry.

14. *The Thesis* for the degree of Pharmaceutical Chemist is required to embody the results of investigation by the student under direction of the Professor in charge of the subject chosen, which must be accepted by the Faculty as early as the first of April. The investigation may consist of valuations of articles in commerce or in nature, trials of methods of analysis, collections of natural articles, preparations or extractions of rare substances, improvement in methods of preparation, or personal research, in *any subject of the course.* A careful comparison of authorities must first be made and references given.

The required *text-books* are named in connection with the work for which they are used, as are also some of the *works of* *reference* most frequently used. Attfield's Chemistry is convenient through the course. Students are not required to provide themselves with the works of reference, many of which are provided at the laboratories. Storer's Dictionary of Solubilities and Watt's Dictionary of Chemistry should be very frequently consulted. The following works are also employed; Tidy's Chemistry; Roscoe and Schorlemmer's Chemistry; Schorlemmer's Organic Chemistry; Gmelin's Hand-book of Chemistry; Bentley and Trimen's Medical Plants; Wittstein's Chemical Analysis of Plants; Husemann's Pflanzenstoffe; Hoffman's Medical Chemistry; Hassall's Adulterations; Prescott's Examination of Alcoholic Liquors; Vogel's Nahrungs und Genusmittel; Hagér's Untersuchungen and Pharmaceutische Praxis; Heppe's Chemischen Reactionen; Wagner's Technology; Planchon's La Determination des Drogues Végétales; Flückiger and Hanbury's Pharmacographia; Dragendorff's Works. The current numbers and complete sets of the leading Foreign and American journals are kept accessible to the student.

THE COLLEGE YEAR in this school commences September 24th, for first year students; and October first for second year students, and closes at the June Commencement. Graduates receive the Degree of Pharmaceutical Chemist. Concerning expenses of Chemical Laboratory work, see page 63. The average cost of material in the Chemical Laboratory has been one dollar and twenty cents per week for each student in Pharmacy.

The order of exercises is given on the following page.

ORDER OF EXERCISES.

FIRST YEAR—First Semester.

Class Work.

Hours.

8½ to 9½ Analytical Chemistry (4)*—daily.
9½ to 10½ Pharmacy (3)—three times a week.

Laboratory Work.

1 to 5 Qualitative Analysis (4)—daily.

Second Semester.

Class Work.

9½ to 10½ Quantitative Analysis (6)—three times a week—from the recess to the close.

10½ to 11½ { Pharmacy (1)—three times a week—until recess.
Botany (3)—five times a week—from the recess to the close.

11½ to 12½ General Chemistry, three times a week—after recess.

Laboratory Work.

1½ to 5½ { Qualitative Analysis (4) (concluded) daily.
Quantitative Analysis (5) daily, or Pharmacy Preparations (13).

SECOND YEAR—First Semester.

Class Work.

11½ to 12½ Pharmaceutical Botany (6), twice a week.

9½ to 10½ { Pharmacy (9)—three times a week.
Crystallography (7)—twelve or fifteen lectures.

10½ to 11½ Quantitative Analysis (6)—three times a week—to holidays.

5 to 6 Materia Medica Lectures (8)—three times a week—for (six) months.

Laboratory Work.

1 to 5 { Microscopic Analysis (6)—three times a week.
Toxicology (11) Anal. Urine (12) daily.
Pharmacopœial Preparations (13) or Quantitative (5). }

Second Semester.

Class Work.

9½ to 10½ Pharmacy (9) { three times a week—to recess.
daily, after recess.

Laboratory Work.

1½ to 5½ { Organic Analysis (10)
Original Work (13, 14) } daily.

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* The figures in parentheses refer to the numbering of the courses given in the preceding pages.

DEPARTMENT
OF
Medicine and Surgery.

I. IMPROVED AND EXTENDED COURSE OF INSTRUCTION.

Within the last two years important changes have been made in the course of instruction in the College of Medicine and Surgery.

The session is now extended to *nine months*, or the entire college year, commencing October 1st, and continuing until the last of June.

Students, however, who matriculated previous to 1877, will be allowed to continue the course on the basis upon which they entered the College, and present themselves for graduation, if they shall so choose, at the end of the first six months of the session, but having the privilege of attending the other three months, when lectures upon other subjects than those embraced within the first six months will be given; and these students may, at their option, come up for graduation at the end of the college year in June.

In the new arrangement a graded course of instruction and study is provided, continuing three college years. In the first year special attention is given, by those who take this fuller course, to Anatomy, Chemistry, Physiology, and Materia Medica and Therapeutics, with appropriate work in the Chemical, Anatomical and Physiological Laboratories, and such examination of drugs in the Pharmaceutical Laboratory as will render them familiar with their sensible properties.

The *second year* of the course the students review the studies of the first year so far as may be necessary to prepare for their examination upon them, and in addition take Pathology (including Pathological Anatomy and Pathological Histology), Hygiene or Preventive Medicine, Medical Chemistry, (Physiological and Pathological), including practical work in the Laboratory; and in addition, attend such lectures on the practical branches, Didactic and Clinical, as may be thought advisable in each particular case.

At the end of the *second* year *final* examinations take place in Chemistry, Anatomy, Physiology, Preventive Medicine, Materia·Medica and Therapeutics.

The *third year* the students are to review General Pathology, Pathological Anatomy, and Pathological Histology, but devote themselves especially to the branches of Obstetrics and Diseases of Women and Children, Ophthalmology, Surgery and Practice of Medicine, and to the application in the Hospital and the College Clinics of the principles taught in the didactic lectures—receiving practical instruction and drilling in Diagnosis and Treatment, preparatory to the final examination which is to test their knowledge of diseases and their management, and their fitness for assuming the responsible duties of the Physician and Surgeon.

But students properly qualified may enter the College at any time and pursue such branches of study taught as they may select, receiving specific certificates for the time spent and for the subjects pursued. After the session of 1878-9, however, no student shall be recommended for the degree of Doctor of Medicine who has not passed a thorough and satisfactory examination on all the subjects taught in the extended course in the Department, and who has not been in regular attendance upon medical lectures in this or some other respectable school of medicine recognized by this college, for at least two full courses, the last of which must have been spent in this Department; and after this session of 1878-9, graduation will occur only at the June Commencement.

While students are earnestly advised to take the three years' course, (and those who are in attendance the three college years will need no other evidence of their time of medical study), yet only two courses are required for graduation, provided evidence is furnished that the candidate has been engaged in the study of medicine (including the time spent in the college) for the usual term of three years.

The final examination of all future matriculates will be conducted, in part at least, in writing; and during the course of study each candidate for graduation will be required to submit to written examinations, and may be called upon to write upon some theme assigned by the instructor or selected by the student; the essay, if required, to be defended before the class. In consequence of these exercises a final Thesis will not be required.

II. THE LECTURE COURSE.

In accordance with these arrangements the thirtieth annual course of lectures will commence on Wednesday, October 1st, 1879, and continue until the last Tuesday of June, 1880, with a recess during the holidays.

Four lectures will be delivered daily; and during the course frequent examinations will take place upon the subjects presented in the lectures. Clinics are held in the college every Wednesday and Saturday, for both medical and surgical cases, at which time examinations are made, prescriptions given, and surgical operations performed, gratuitously to patients, in the presence of the class.

III. TERMS OF ADMISSION.

Every candidate for admission to the Medical Department must be eighteen years of age, and must present to the Faculty satisfactory evidence of a good moral character.

Unless already graduates or matriculates of the University or of some literary or scientific college, or graduates or advanced members of some academy or high school, or unless holding certificates from some public school board, as being properly qualified teachers, or unless having certificates based upon an examination of some regular medical society as being properly qualified to engage in the study of medicine, all candidates must be examined as to their elementary education and their fitness to enter the college and pursue properly and profitably the study of the profession. The examination will be in writing and will include an account of the candidates' educational advantages, and answers upon such questions of *Arithmetic*, Geography, History, Forms of Government and current events as shall show their practical intelligence; and particularly will they be required to correct imperfect English, so as to test their ability to express ideas correctly in writing. Since many present themselves a long time after completing their school education, the examination will not be technical, nor in the rules of school books, which are often soon forgotten, but it will be more to exhibit the results of previous training, and to indicate their present practical capacity, and their probable ability to become reputable members of the profession. Such an examination is believed to be quite as effectual in guarding the profession from the introduction of illiterate and unworthy members as the requirements of a limited specified amount of school-book knowledge, to be studied up for the occasion.

These preliminary requirements are not now of as high an order as it is hoped they will before long be made, but they are intended to be as exacting as is fairly practicable, and as is consistent with the interests and rights of the profession and the people.

Examinations will be held at 2 P. M. on Monday and Tuesday, September 29 and 30, 1879. Candidates are required to present themselves on one of these days, as they are expected to be in attendance on the first day of the term, at which time the regular course of instruction will commence. To provide for cases in which it is absolutely impossible for the candidates to be present at this time, supplementary examinations will be held at such times as may be determined upon by the Faculty, but no excuse, except of an urgent character, will be accepted for failure to appear at the first examination. Certificates for attendance are given for the actual period of attendance only.

Before admission to examination every student is required to present to the Dean of the Faculty the Treasurer's receipt for the payment of the matriculation fees and annual dues. It will therefore be necessary for the candidates to apply first to the Steward at his office in the University Hall, register their names as students in the Department of Medicine and Surgery, and then pay their fees to the Treasurer. In case of rejection, the moneys paid preliminary to examination will be refunded by the Treasurer.

IV. ADMISSION OF WOMEN.

Recognizing the equality of rights of both sexes to the highest educational advantages, the Board of Regents, a few years since, made provision for the medical education of women, and they are now admitted to this, as to all other departments of the University, on the same conditions that are required of men. It is proper to state, however, in answer to numerous inquiries which are made on this point, that the course of instruction for women, though equal in all respects to that provided for the men, is for the most part, given separately, the two classes being together in the lecture room, however, in the department of General Chemistry. Ample provision has been made for the women's classes in the way of lecture rooms, dissecting rooms, etc.

V. CONDITIONS OF GRADUATION.

Those candidates preparing to graduate at the close of their second course of lectures, must announce their intention at the beginning of that course, in order to receive those repeated examinations necessary to attest their qualifications.

Those proposing to receive the full three years' graded course before presenting themselves for graduation, must announce their intention to the Dean at the time of their matriculation, or whenever they have thus determined, so that they may be classified, and receive proper directions respecting attendance and exercises, and have proper places assigned them at the various lectures they may attend, and that records may be kept of their course, attendance and progress. They will from time to time receive certificates of attendance, and of their standing on the subjects in which they have been fully examined.

To be admitted to the degree of Doctor of Medicine, all students must present evidence ot the possession of a good moral character, of being twenty-one years of age, of having been engaged in the study of Practical Anatomy and Practical Chemistry, and of having pursued the regular study of medicine for the period of three years, including the time spent in attendance upon lectures,—not in addition to this time,—and must have attended two full courses of lectures on the different branches of medical science, the last of which must have been in this college; but to encourage a higher grade of preliminary acquirements, and in recognition of the value to a candidate of an extended course of scientific and literary studies, an allowance of six months from the three years of medical studies is made in favor of graduates of the College of Arts and Sciences in this University, and of other respectable literary colleges; and also in acknowledgement of the amount of medical knowledge obtained in a full course of Pharmaceutical study, an allowance of twelve months is made for graduates in the Department of Pharmacy in this University.

It is proper to remark that the two medical schools in this University are distinct organizations, and that, under the regulations established by the Regents, the professors in one school are not called to take any part in conducting the final examinations of students in the other, or in recommending them for graduation, or in signing their diplomas.

VI. FACILITIES FOR INSTRUCTION.

The Department of Medicine and Surgery is abundantly supplied with plates, photographs, models, specimens, preparations, apparatus and instruments, for the purpose of illustrating the different studies embraced in the course. The apparatus in the Department of Chemistry and of Chemical Physics, is probably unsurpassed, if indeed it be equalled, by that of any medical college in the country. Additions are made from time to time to these collections by special appropriations by the Board of Regents, so that the Faculty are able to adopt every new method of illustration, and to exhibit to the classes each year all important improvements in the way of instruments and apparatus that are employed in the practice of medicine and surgery, and to show their application.

The museums of Professors Ford and Sager, embracing several thousand specimens, which are the result of many years' labor in the collection and preparation of materials intended to aid directly in teaching, have now become the property of the University, and are used in the daily work of the class-rooms. These museums contain a valuable collection of bones, illustrating healthy as well as diseased conditions, and showing the various changes that occur from infancy to old age, and the processes of first and second dentition; dissections, general and partial, of the vascular, nervous and muscular systems, both normal and abnormal; models in wax, papier maché and plaster, of various portions of the body, illustrating morbid growth, skin diseases, etc.; preparations in the comparative embryology, neurology and craniology of the vertebrata; human embryology, and anatomy and pathology of the diseases of women, etc. The collection of monstrosities, both single and double, of man and the lower animals, is unusually full and valuable.

The department of the museum illustrative of Materia Medica, consists of a very complete suite of crude organic medicinal substances, embracing between five and six hundred specimens imported from Paris, finely displayed and arranged according to their order in natural history; besides about one thousand other specimens of simple mineral and vegetable substances, and pharmaceutical and officinal preparations, active principles, etc., arranged in groups convenient for study. Medicinal botany is further illustrated by between one and two hundred large finely colored plates.

The above collections, to which additions are made yearly, are catalogued and arranged in cases. The museum thus affords a secure depository for objects of interest and value, and it is to be hoped that the alumni and other friends of the

University will continue their generous donations of such materials.

Arrangements have been made by which an ample supply of material for the purposes of practical anatomy has been secured, and special attention is given to this important study. Material for this department can be furnished as abundantly, and at as low rates as at other institutions of the kind.

The Chemical Laboratory is one of the largest and best equipped in the United States, and every student before he can receive the degree of M. D., is required to take a course of practical medical chemistry, which requires, according to the expertness of the student, from ten to sixteen weeks of Laboratory work for two or three hours each afternoon when the lectures are not being delivered.

The required work in the Laboratory of Chemistry consists of two branches, Qualitative Chemistry, and the Analysis of Urine. In the first branch—Qualitative Chemistry—students are taken in classes of not over forty each, for daily drill in the class-room, to direct the daily practice in the Laboratory. The work of each class continues about seven weeks, after a week of class drill in notation, the classes commencing on October 1st, November 20th, January 16th, March 11th, and April 25th. Secondly, Analysis of Urine, in daily Laboratory practice, for five to seven weeks, with accompanying lectures.

By action of the Faculty of the College of Medicine and Surgery, two extended optional courses have been established. one in Physiological and Pathological Chemistry, and another in Toxicology. The first will embrace analysis of the Blood. Urine, Gastric Juice, Brain, Bile, Bone, Muscles, and other fluids and solids of the body. The second will embrace courses of Qualitative and Quantitative Analysis, and the special examination of foods and of the tissues and fluids of poisoned animals, for the detection of the various mineral and organic poisons. Each of these special courses not required for graduation employs about one collegiate year of Laboratory work.

Neither of these extended courses will be required for graduation. They are designed for those who make a speciality of such work, and neither will require a longer time of Laboratory attendance than one collegiate year.

Those who attend either of those courses, and who pass a satisfactory examination upon the subjects at the conclusion, will receive a certificate for the same.

By a recent act of the Legislature of Michigan, a liberal appropriation for the equipment and conducting of a Physiological Laboratory has been made; and Microscopes, a stereopticon, sphygmograph, and numerous other instruments for extended practical work have been procured, and are in daily use. By the coöperation of the Professors of Anatomy, Physiology, and Pathology, and under proper, efficient direction, and with ample assistance, the students in the College of Medicine and Surgery, without additional charge, will have opportunities of practical instruction in Experimental Physiology, in Histology, both physiological and pathological; and this, supplemented by instruction in Pathological Anatomy and Medical Chemistry, is designed to afford facilities to numbers for minute and specific scientific study and research exceedingly rare in this country, the want of which is deeply felt by all advanced medical practitioners.

Junior students will have an opportunity under competent instruction to study Comparative Anatomy and Physiology practically by dissecting various animals, and while becoming familiar with structures and tissues, will also acquire dexterity in the use of instruments preparatory to the more strictly professional manipulations.

Recognizing the importance of combining clinical with didactic instruction, College Clinics have for years past been conducted on Wednesdays and Saturdays during the session, for Medical, Surgical and Opthalmic patients. These are examined, prescribed for, and when necessary, operated upon before the class; and large numbers, especially of chronic cases, from this and neighboring States, have availed themselves of these privileges.

By the liberality of the last two Legislatures of the State of Michigan, aided by the city of Ann Arbor, and under the care of the Board of Regents, a Hospital has been established, and new pavilion buildings have been erected upon the University grounds of sufficient capacity for a large number of patients. It is now thoroughly equipped and well supported, and is in immediate charge of a competent house surgeon and physician and an experienced matron. The whole is placed under the direction of the Faculty of the College whose members will regularly attend (each upon such cases as come within his special department) upon the patients, and will give careful clinical instruction in the wards to the properly qualified students of the College.

The Hospital will be kept open for patients applying from this and other States during the whole year, the only restriction being that no contagious diseases are admitted.

The expense to patients will be only for their board and for unusual appliances—the services of the Faculty being rendered gratuitously.

Under the present reorganization, patients are much better accommodated, and clinical instruction is rendered more systematic and efficient than has hitherto been possible.

Besides these aids in study, the students in medicine are allowed free access to the general botanical, zoological and geological cabinets of the University, which are estimated so contain 225,000 specimens. The General Library contains about 26,000 volumes, of which some 2,000 are medical works. A complete catalogue of the library, arranged both by the names of authors and by subjects, is accessible to all students. The leading medical periodicals of this country and of Europe are taken and kept on file in the Library.

VII. FEES AND EXPENSES.

The fees,* which must be paid in advance, are as follows:

Matriculation Fee.—Residents of Michigan, $10; non-residents, $25.

Annual Dues.—Residents of Michigan, $20; non-residents, $25.

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* No portion of the fees can be refunded to students who leave the University during the academic year, except by order of the Board of Regents.

GRADUATION FEE.—For all alike, $10.

The admission fee is paid but once, and entitles the student to the privileges of permanent membership in any department of the University. The annual tax is paid the first year, and every year thereafter. For other details of expenses, see pp. 20-21.

VIII. TEXT AND REFERENCE BOOKS.

Any of the following text books in each department will answer the necessities of the student; and wherever a preference exists, it is given to those first in order on the list.

ANATOMY.—Gray, Wilson, Leidy, Peaslee, Stricker.

PHYSIOLOGY.—Küss, Kirkes, Dalton, Marshall. *For Reference*—Flint, Carpenter, Todd and Bowman, Sanderson's Hand-book for the Physiological Laboratory.

CHEMISTRY.—*In General Chemistry.*—Miller's Chemical Physics, Miller's Inorganic Chemistry, or Eliot and Storer's Manual of Chemistry. *For Laboratory.*—Douglas and Prescott's Analysis, Vaughan's Physiological Chemistry, Wormley on Poisons.

MATERIA MEDICA AND THERAPEUTICS.—H. C. Wood, Jr., Stillé, Waring, Ringer, Biddle. *Special Subjects*—Headland on the Action of Medicines, Anstie on Stimulants and Narcotics, Harley on the Old Vegetable Neurotics.

PATHOLOGY AND PATHOLOGICAL ANATOMY.—Wagner, Green, Rindfleisch, Billroth, Paget, Williams's Principles. *For Reference*—Rokitansky and Virchow.

OBSTETRICS.—Playfair, Meadows, Leishman, Tyler Smith, Byford, Schrœder, Cazeaux, Hodge. *Special Subjects*—Tanner on Pregnancy, Barnes on Obstetric Operations, Elliott's Obstetric Clinic, Barker on Puerperal Diseases.

DISEASES OF WOMEN.—Thomas, Byford, Hewitt, West, Barnes, Hodge. *Special Subjects*—Tilt on Uterine Therapeutics, Klob on Pathological Anatomy of the Female Sexual Organs, Peaslee on Ovariotomy, Sims on Uterine Surgery, Emmet on Vesico-Vaginal Fistula.

DISEASES OF CHILDREN.—J. L. Smith, Vogel, Tanner, Meigs, and Pepper. *Special Subjects*—Eustace Smith on the Wasting Diseases of Infancy and Childhood, Comb on the Management of Infancy, Routh on Infant Feeding, Holmes or Guersant on the Surgical Diseases of Children.

PRACTICE OF MEDICINE.—Aitkin, Edited by Clymer, Niemeyer, Roberts, Flint, Watson, Tanner, Wood. *Special Subjects.*—Walshe or Flint on the Lungs, Williams on Pulmonary Consumption, Flint or

Stokes on the Heart, Roberts or Beale on Urinary Diseases, Budd on the Stomach, Chambers on Indigestion, Murchison on the Liver, Da Costa on Medical Diagnosis, Loomis on Physical Diagnosis. *For Reference.*—Reynold's System of Medicine, Trousseau's Clinical Lectures, Ziemssen's Cyclopedia.

SURGERY.—Syme, edited by Maclean, Erichsen, Hamilton, Druitt. *Special Subjects*—Billroth on Surgical Pathology, Hamilton on Fractures and Dislocations, Bumstead on Venereal Diseases, Sayre on Club Foot, Sir Henry Thompson or Gouley on Genito-Urinary Organs, C. Henri Leonard on Bandaging. *In Minor Surgery and Surgical Appliances*—Bell, Le Gros Clarke, Anandale, Wales, Sargent. *For Reference*—Gross's System of Surgery and Holmes's System of Surgery.

OPHTHALMOLOGY AND OTOLOGY.—*On the Eye.*—Sœlberg, Wells, Stellwag, Metz, Brown on the Ophthalmoscope. *On the Ear.*—Roosa or Toynbee with Hinton's Supplement, Burnett's Treatise on the Ear.

The student who is commencing a course of reading without an instructor, is recommended to devote the most of his time for the first year to the elementary branches, Anatomy, Physiology, and Chemistry, both general and medical; then advancing to the other studies to select one of the first mentioned text-books in each department, passing to the "*special subjects*" only when near the completion of the course, or as he may desire for particular reasons to become more fully informed on such subjects. The books mentioned are standard authorities, and will form a good nucleus for a medical library.

IX. ASSIGNMENT OF SEATS.

Students on arriving in Ann Arbor can obtain necessary information in regard to rooms, board, etc., by calling at the Steward's office. Seats in the lecture rooms are assigned by selection to students in the order of registration on the Treasurer's books, and according to the class they are to enter; and each student is expected to occupy during the session such seat as may be assigned to him. In the advanced lectures the graduating class, by courtesy, are allowed the privilege of the seats nearest the operating table and lecturer's desk.

Letters of inquiry may be addressed to "The Dean of the Medical Faculty," Ann Arbor, Michigan.

By comparing the present provisions with those of former years it will be seen that very great advancements have been made in the means offered for a complete and thorough medical education. The plan of nine months' sessions and three years' graded course in medical schools in this country, inaugurated by Harvard College, has been followed by the venerable University of Pennsylvania in a graded course, but without extension of the length of the sessions; and it is a cause of congratulation that this extension of the course in the University of Michigan, long since recommended by the Faculty, and more recently by the Alumni of this College, and others of the medical profession of the State, has at length been accomplished. The great importance of this movement must be evident to all who appreciate the vast extension of medical science, which has occurred since medical schools were established among us with four months' terms, or who compare the short courses prevalent in this country with those so much longer in Europe. The great fault with many American medical students is a desire to rush speedily over their course of study and enter, though but partially prepared, into the responsible duties of active practice. It is found, however, by the increase in the size of our classes since the extension of the term of instruction has been effected, that there are already many, and it is hoped that the number will increase, who desire more thorough and extended preparation, and that since by the liberality of the State the means of securing this thorough training are put within their reach, still more who have talent, energy, perseverance and high aims will avail themselves of the increased advantages offered.

In the plan of the extended course provided, and which we are sure it will be for the interest of every medical student to take, the attempt has been made so to combine a successive or graded course of study with reviews by repetition of the more important lectures, as to obviate the serious objection of dismissing one part of a connected subject before its relations to other parts can be seen and appreciated, and to avoid also the confusion incident to the presentation of so many parts of the general subject to the mind of the student at the same time and at an early period of his studies.

This extended course affords time for the teaching and study of subjects not generally, or very imperfectly, taught in our public schools—such as Ophthalmology, Dermatology, Diseases of the Mind, Preventive Medicine, Medical Jurisprudence, Pathological Anatomy, etc., and especially will it give more time for thorough work in the Laboratories now provided. Though not fully supplying the defects of preliminary education, this longer course, accompanied with repeated examinations and written exercises, will supplement such earlier training as may have been enjoyed, and of itself will be a most efficient means of mental discipline, and of literary as well as scientific culture.

This plan which has been adopted with the view of avoiding the impracticable and of securing real and decided advancement, is presented in the hope that it will commend itself to the judgment and support of the profession. Upon the members of the profession who have encouraged such advancements by repeated recommendations, the schools making such improvements should be able to depend for more substantial encouragement than mere advice. Should physicians while professing a desire for reform, send the students whom they control to schools where diplomas are soonest and most easily obtained, the cause of advanced medical education must suffer. Upon their consistency and practical efforts for reform, the success of these experiments must depend.

In answer to many inquiries, it is thought desirable more explicitly to state, that no previous study of medicine is required for admission to the college—any person of proper age and character, and having the requisite elementary *English* education being eligible to enter.

Should students be ready to commence the study of medicine near the opening of the term in October, it is advised that they enter the college at once and remain during their three years of pupilage—the instruction in the graded course being adapted to beginners. Should it be convenient to commence medical studies at a period distant from the beginning of the college year, they should procure one of the text-books in Anatomy (Gray's), in Physiology, in Chemistry, and perhaps in General Pathology and in Materia Medica, and a *Medical Dictionary*. A study of such works, even without a preceptor, will afford some general acquaintance with these fundamental subjects, and will, at least, give a knowledge of *terms* which will be of service in more readily comprehending the lectures.

Department of Law.

I. DEPARTMENT OF LAW.

In this Department it has been the constant endeavor of the Faculty to make the instruction imparted and the advantages afforded equal to any attainable elsewhere in the country; and in this they believe they have been entirely successful. No effort will be spared to make the department deserve in the future a prosperity like that it has hitherto enjoyed. A spacious building is devoted to its accommodation, with ample debating and society rooms, and in every respect the conveniences of the department are exceptionally good.

II. TERMS OF ADMISSION.

The requisites for admission are, that the candidate shall be not less than eighteen years of age, and be furnished with a certificate giving satisfactory evidence of good moral character. Some previous reading in the law is desirable, but it is not absolutely required, though it is expected that all students will be well grounded in at least a good English education, and capable of making use of the English language with accuracy and propriety. The course of instruction for the two terms has been carefully arranged, with a view to enable students to enter profitably at any stage of their studies, and it is not important which course of lectures is first taken.

III. COURSE OF INSTRUCTION.

The design of the Department is to give instruction that shall fit students for practice in any part of the country. The course will embrace the several branches of Constitutional, International, Maritime, Commercial and Criminal Law, Medical Jurisprudence, and the Jurisprudence of the United States;

and will include such instruction in Common Law and Equity Pleading, Evidence and Practice as will lay a substantial foundation for practice in all departments of law.

The course will be continued through a period of two years, with one term in each year, commencing on the first day of October, and continuing until the Law Commencement in the last week of March ensuing. Ten lectures with accompanying examinations will be delivered each week during the term. For one year they embrace the following subjects:

The Origin and History of Equity Jurisprudence.

The General Heads of Equity Procedure and Nature and Forms of Equitable Remedies.

Criminal Law, and Medical Questions bearing on it;

The Laws of Evidence, and their application to Legal Proceeding;

Contracts;

Title to personal Property by Gift, Inheritance, Sale, Mortgage, Assignment, and by Operation of Law;

Bills of Exchange and Promissory Notes, and Commercial Law generally;

Estates in Real Property; Easements;

Title to Real Property; Domestic Relations.

For the year following the following subjects:

Some Special Heads of Evidence, and Equity Jurisprudence;

Equity Pleadings and Practice; Jurisprudence of the United States;

Shipping and Admiralty; Bailments;

Agency; the Law of Corporations; Common Law Pleading and Practice; Constitutional Law; Partnership; Uses and Trust; Wills, their Execution, Revocation, and Construction.

The Administration and Distribution of Estates of Deceased Persons.

Moot Courts are held from time to time during the term, for the argument of cases previously given out by the Professors by students designated to discuss them. They will be presided over by the Professor lecturing for the day, who, at the conclusion will review the arguments and give his decision upon the points involved. Club Courts will also be organized among the students, to be arranged and conducted by themselves, with such assistance from the members of the Faculty as may be desired. These Courts, thus far, have been found alike interesting and useful to those who have participated in them.

IV. LIBRARY.

A well selected and very useful Law Library is open for consultation by students at all reasonable hours. The rooms of the Professors are near the Library, and they will be ready at all times to furnish to students aid in their studies and investigations. The General Library of the University is also at all times open to the students of this department.

V. DEGREES.

The degree of Bachelor of Laws will be conferred upon such students as shall pursue the full course of two years in this department, and pass an approved examination. It will also be conferred upon those who, having attended another Law School for a period equal to one year of our course, or practiced law for one term under a license from the highest court of general jurisdiction in any State, shall also pursue one year's course in this department, and pass a like examination. In Michigan, the degree entitles the resident graduate to an immediate license to practice in all the courts of the State.

Candidates for degrees will be required to prepare and deposit with the Faculty, at least one month before graduation, a dissertation not less than forty folios in length, upon some legal subject selected by themselves. These theses will be filed and preserved in the Library.

VI. BOOKS.

While several copies of each of the leading text-books will be found in the Library, it is exceedingly desirable that students should supply themselves with such as they may need at their rooms. The Professors will lend them aid in making proper selections, and no loss will be incurred, as the books will be found essential in subsequent practice. Students will find that it will greatly facilitate their studies to have them at hand at all times.

VII. FEES AND EXPENSES.

The fees,* which must be paid in advance, are as follows:

Matriculation Fee.—Residents of Michigan, $10; non-residents, $25.

Annual Dues.—Residents of Michigan, $20; non-residents, $25.

Graduation Fee.—For all alike, $10.

The admission fee is paid but once, and entitles the student to the privileges of permanent membership in any department of the University. Tbe annual tax is paid the first year, and every year thereafter. For other details of expenses see pp. 20-21.

VIII. GENERAL REMARKS.

The Faculty are frequently applied to by letter for advice upon the question of whether it is desirable to enter upon the study of law, and acquire some general knowledge of the principles, before admission to the Department. It is somewhat difficult to lay down general rules that can be advantageously applied in all cases, but the Faculty are of opinion that for the first year at least, more positive benefit is received from the lectures, and more positive advancement in the law made, by students who have read before coming, at least the Commentaries of Blackstone, than by those who are beginners here. But the Faculty are aware of the difficulty experienced by the student in giving proper direction to his reading and investigation at the beginning; and they do not therefore make it a condition of admission that there shall be any prior reading in law whatever. The want of such prior reading will, doubtless, in many cases, be fully compensated in the aid the beginner may receive here in the outset. It is not often that the student receives the needed assistance except in law schools. The active practitioner engrossed with the cares of business, cannot—or at least, as proved by experience, does not—furnish the students who place themselves in his charge, the attention and assistance essential to give a correct direction to their reading, and to teach them to apply it usefully and aptly in their subsequent professional life. The reading of a student in a law office is practically the study of the law by himself, and without assistance; and he neither acquires that familiarity with books, and that facility of reference which it will be the aim of this department to assist in acquiring, nor learns anything of the practical application of legal principles, beyond what he may pick up from observation of the practice of his preceptor. The effort here will be to make not *theoretical* merely, but *practical* lawyers; not to teach principles merely, but how to apply them. To this end, the Moot Court will be made the forum for the discussion of such practical questions as must frequently arise in a professional career, at the bar; and the attention of the Faculty will be directed not less to the application of the points discussed to actual cases, than to the elucidation of the legal questions. An opportunity will be afforded all the senior students to participate in this court, and they will at all times have such assistance in their Club Courts as they find themselves in need of.

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* No portion of the fees can be refunded to students who leave the University during the academic year, except by order of the Board of Regents.

While thus endeavoring to impart legal knowledge, the fact will not be lost sight of, that a high moral standard is a most important requisite to a successful and honorable career; and no pains will be spared in impressing this fact upon students, and in inculcating a high tone of professional ethics and action.

Those who desire any further information concerning the Law Department, may make their inquiries of Hon. T. M. COOLEY, Dean of the Law Faculty.

THE
Homœopathic Medical College.

I. ENLARGED AND EXTENDED INSTRUCTION.

The provision of the Legislature has enabled the Board of Regents to meet the growing demands for a more advanced medical education by extending the course of teaching from six to nine months in each year, and by enlarging the curriculum. Henceforth the session includes the entire University year, extending from October first to July first.

Students who matriculated before the session of 1877-8 will be allowed to complete the course according to the plan of teaching in force when they entered, and such of them as may desire so to do, can present themselves for graduation at the end of the first six months of the session. All are, however, advised to complete the nine months' course—the last three months of which will embrace subjects not touched upon in the first six.

In addition to this extension of the term, a graded course to include three years' study will be provided. The *first* year of this course will include Anatomy, Histology, Physiology, Chemistry, and Materia Medica, with the necessary practical work in the Chemical and Physiological Laboratories. This years' Materia Medica Work will be devoted to teaching the source, nature, origin and method of preparing remedies, with their physiological action and a general survey of their pathogenesis.

In the *second* year the above studies will be reviewed, and the student will take up Pathology, Pathological Anatomy, Chemistry, in its application to Physiology and Pathology, and

Hygiene or Preventive Medicine. The Materia Medica work of this year will consist of special analyses and syntheses of drug-provings. In addition the student will attend such didactic and clinical lectures on the Practical Branches as his progress shall render advisable.

At the end of the *second* year, *final examinations* will be held in Anatomy, Histology, Chemistry, and Preventive Medicine.

In the *third* year, Pathology and Pathological Anatomy will be reviewed, and the student will enter upon Ophthalmology, Obstetrics, Diseases of Women andChildren, Surgery, and the Theory and Practice of Medicine, with practical instruction in Diagnosis and Treatment.

In this course Therapeutics and Experimental Pathogenesy will be taught—the latter with all the aids of the Chemical and Physiological Laboratories. Every opportunity will be given to those desiring to make original investigations in drug action.

This course is for the present elective, but after the session of 1878-9, no student shall be recommended for the degree of Doctor of Medicine who has not passed a thorough and satisfactory examination on all the subjects taught in the extended course, and who has not been in regular attendance upon Medical Lectures in this or some other respectable school of Medicine for at least two full courses, the last of which must have been in this College; and after the session of 1878-9 graduation will occur only at the June Commencement.

The final examination of all future matriculates will be conducted, in part at least, in writing; and during the last session each candidate for graduation will be required to submit to written examinations, and may be called upon to write upon some theme assigned by the instructor or selected by the student: the essay, if required, to be defended before the class. In consequence of these exercises a final thesis will not be required.

Properly qualified students may enter the College at any time, and pursue such of the studies therein taught as they may select, and they shall receive special certificates for the time spent and the study or studies pursued. By action of the Regents special rates have been established for the benefit of such students. For practical laboratory work this arrangement affords an opportunity of which it is hoped many will be glad to avail themselves, and the advantages are second to none in America.

The Board of Regents have enacted that henceforth all examinations of matriculates of this College for its degree shall be made by its Faculty and its Board of Examiners.

II. THE LECTURE COURSE.

In accordance with these arrangements the fourth annual course of lectures will commence on Wednesday, October 1st, 1879, and continue until the last Wednesday of June, 1880, with a recess during the holidays.

Four lectures will be delivered daily; and during the course frequent examinations will take place upon the subjects presented in the lectures. Clinics are held in the college every Wednesday and Saturday, for both medical and surgical cases, at which time examinations are made, prescriptions given, and surgical operations performed, gratuitously to patients, in the presence of the class.

III. TERMS OF ADMISSION.

Every candidate for admission to this college must be eighteen years of age, and must present to the Dean satisfactory evidence of good moral character. Unless already a matriculate of the University or a graduate of some respectable college, academy or high school, every candidate shall be examined as to his previous education and his fitness to enter upon and appreciate the technical study of medicine. The diploma or certificate of graduation from such institutions must be presented to the Dean of the Faculty by the candidate in order to secure exemption from the examination, which will be in writing, and will cover the ordinary branches of an English education. This examination is not yet so exacting in its demands as we hope to be able to make it before long, but it is intended to test the student's acquaintance with the fundamental branches of an English education, and his general intelligence and capacity to appreciate and profit by professional instruction.

Examinations will be held at 2 P. M. on Monday and Tuesday, September 29 and 30, 1879. Candidates are required to present themselves on one of those days, as they are expected to be in attendance on the first day of the term, at which time the regular course of instruction will commence. To provide for cases in which it is absolutely impossible for the candidates to be present at this time, supplementary examinations will be held at such times as may be determined upon by the Faculty, but no excuse, except of an urgent character, will be accepted for failure to appear at the first examination. Certificates of attendance are given for the actual period of attendance only.

Before admission to examination every student is required to present to the Dean of the Faculty the Treasurer's receipt for the payment of the matriculation fees and annual dues. It will therefore be necessary for the candidates to apply first to the Steward at his office in the University Hall, register their names as students in the Department of Medicine and Surgery, and then pay their fees to the Treasurer. In case of rejection, the moneys paid preliminary to examination will be refunded by the Treasurer.

IV. ADMISSION OF WOMEN.

Recognizing the equality of rights of both sexes to the highest educational advantages, the Board of Regents, a few years since, made provision for the medical education of women, and they are now admitted to this College, as to all other departments of the University, on the same conditions that are required of men. It is proper to state, however, in answer to numerous inquiries which are made on this point, that the course of instruction for women, though equal in all respects to that provided for the men, is for the most part, given separately, the two classes being together in the lecture room, however, in the department of General Chemistry. Ample provision has been made for the women's classes in the way of lecture rooms, dissecting rooms, etc.

V. CONDITIONS OF GRADUATION.

Those candidates preparing to graduate at the close of their second course of lectures, must announce their intention at the beginning of that course, in order to receive those repeated examinations necessary to attest their qualifications.

Those proposing to receive the full three years' graded course before presenting themselves for graduation, must announce their intention to the Dean at the time of their matriculation, or whenever they have thus determined, so that they may be classified, and receive proper directions respecting attendance and exercises, and have proper places assigned them at the various lectures they may attend, and that records may be kept of their attendance and progress. They will from time to time receive certificates of attendance, and of their standing on the subjects in which they have been fully examined.

To be admitted to the degree of Doctor of Medicine, all students must present evidence of the possession of a good moral character, of being twenty-one years of age, of having been engaged in the study of Practical Anatomy and Practical Chemistry, and of having pursued the regular study of medicine for the period of three years, but to encourage a higher grade of preliminary acquirements, and in recognition of the value to a candidate of an extended course of scientific and literary studies, an allowance of six months from the term of medical studies is made in favor of graduates of the College of Arts and Sciences in this University, and of other respectable literary colleges; and also in acknowledgement of the amount of medical knowledge obtained in a full course of Pharmaceutical study, an allowance of twelve months is made for graduates in the Department of Pharmacy in this University.

VI. FACILITIES FOR INSTRUCTION.

Students in this college will receive instruction in Materia Medica, Therapeutics, and Experimental Pathogenesy from Prof. Jones; in Theory and Practice, and Clinical Medicine from Prof. Gatchell; in Surgery, from Prof. Franklin. Obstetrical and Gynæcological Therapeutics will be taught jointly by Professors Gatchell and Franklin for the present.

For all other studies the students will attend the lectures in the Department of Medicine and Surgery, and the lectures and Demonstrations in the Chemical and Physiological Laboratories. While in attendance upon such lectures and demonstrations they shall be entitled to all the privileges accorded to students in said Department, and shall conform to all the requirements of said Department, so far as they apply to the branches which they pursue.

Liberal provision is made by the Board of Regents for illustrating the various branches of instruction by plates, preparations, specimens and apparatus. The department of chemistry and chemical physics is probably unsurpassed, if indeed it is equalled, in the extent and thoroughness of its equipments, by that of any medical college in the country. The museums, containing several thousand specimens, comprise a valuable collection of bones, amply illustrating both physiological and pathological conditions of all ages, and showing the processes of dentition, of growth, and of decay in the osseous system, dried preparations, normal and abnormal, of the different tissues of the body, including muscles, blood vessels, nerves, etc.; models and casts illustrating skin diseases, tumors, and pathological changes in the various organs. In the sections devoted to comparative embryology and craniology, and in human embryology, and the diseases of women, the collections are especially interesting. The specimens of monstrosities, both single and double, of man and the lower animals, are very numerous and instructive.

Beside these aids in study, the students in medicine are allowed free access to the general botanical, zoological and geological cabinets of the University, which are estimated to contain 225,000 specimens. The scientific and philosophical lectures collateral to medicine, which are given in the Literary Department, are also open to our students. The General Library contains about 26,000 volumes, of which some 2,000 are medical works. A complete catalogue of the Library, arranged both by the names of authors and by subjects, is accessible to all students. The leading medical periodicals of this country and of Europe are taken and kept on file in the Library.

Arrangements have been made by which an ample supply of material for the purposes of practical anatomy has been secured, and special attention will be devoted to rendering this important study as advantageous as possible to the student. Experience has shown that *material* can be purchased here abundantly and at reasonable rates.

The Chemical Laboratory is one of the largest and best equipped in the United States, and every student before he can receive the degree of M. D., is required to take a course of practical medical chemistry, which requires, according to the expertness of the student, from ten to sixteen weeks of Laboratory work for two or three hours each afternoon when the lectures are not being delivered.

The required work in the Laboratory of Chemistry consists of two branches, Qualitative Chemistry, and the Analysis of Urine. In the first branch—Qualitative Chemistry—students are taken in classes of not over forty each, for daily drill in the class-room, to direct the daily practice in the Laboratory. The work of each class continues about seven weeks, after a week of class drill in notation, the classes commencing on October 1st, November 20th, January 16th, March 11th, and April 25th. Secondly, Analysis of Urine, in daily Laboratory practice, for five to seven weeks, with accompanying lectures.

Two extended optional courses have been established, one in Physiological and Pathological Chemistry, and another in Toxicology. The first will embrace analysis of the Blood, Urine, Gastric Juice, Brain, Bile, Bone, Muscles, and other fluids and solids of the body. The second will embrace courses of Qualitative and Quantitative Analysis, and the special examination of foods and of the tissues and fluids of poisoned animals, for the detection of the various mineral and organic poisons. Each of these special courses not required for graduation employs about one collegiate year of Laboratory work.

Neither of these extended courses will be required for graduation. They are designed for those who make a speciality of such work, and neither will require a longer time of Laboratory attendance than one collegiate year.

Those who attend either of those courses, and who pass a satisfactory examination upon the subjects at the conclusion, will receive a certificate for the same.

For further details of Laboratory advantages and work, see pp. 63-65.

By a recent act of the Legislature of Michigan, a liberal appropriation for the equipment and conducting of a Physiological Laboratory has been made; and Microscopes, a stereopticon, sphygmograph, and numerous other instruments for extended practical work have been procured, and are in daily use. By the coöperation of the Professors of Anatomy, Physiology, and Pathology, and under proper, efficient direction, and with ample assistance, the students of this College without additional charge, will have opportunities of practical instruction in Experimental Physiology, in Histology, both physiological and pathological; and this, supplemented by instruction in Pathological Anatomy and Medical Chemistry, is designed to afford facilities to numbers for minute and specific scientific study and research exceedingly rare in this country, the want of which is deeply felt by all advanced medical practitioners.

While all students in the Department are admitted to this Laboratory, the Faculty would suggest to those who desire to enter it, that it would be very helpful to them to make themselves familiar before admission to the medical school with the general facts of Biology and of Physiology, by such dissections and experiments as are described in the little manuals of Huxley and Martin, and of Foster and Langley. Instruction in these topics is given in the Department of Literature, Science and the Arts in this and some other Universities.

Recognizing the importance of combining clinical with didactic instruction, College Clinics will be conducted on Wednesdays and Saturdays during the session, for Medical, Surgical and Ophthalmic patients. These are examined, prescribed for, and when necessary, operated upon before the class; and large numbers, especially of chronic cases, from this and neighboring States, have availed themselves of these privileges.

By the liberality of the last two Legislatures of the State of Michigan, aided by the city of Ann Arbor, and under the care of the Board of Regents, a Hospital has been established, and new pavilion buildings have been erected upon the University grounds of sufficient capacity for a large number of patients. It is now thoroughly equipped and well supported, and is in immediate charge of a competent house surgeon and physician and an experienced matron. A portion is placed under the immediate direction of the Faculty of this College whose members will regularly attend (each upon such cases as come within his special department) upon the patients, and will give careful clinical instruction in the wards to all medical students.

The Hospital will be kept open for patients applying from this and other States during the whole year, the only restriction being that no contagious diseases are admitted.

The expense to patients will be only for their board and for unusual appliances.

Under the present reorganization, and with an opportunity for Homœopathic treatment, it is expected that patients will be much better accommodated, and clinical instruction rendered more systematic and efficient than has hitherto been possible.

VII. FEES AND EXPENSES.

The fees,* which must be paid in advance, are as follows:

Matriculation Fee.—Residents of Michigan, $10; non-residents, $25.

Annual Dues.—Residents of Michigan, $20; non-residents, $25.

Graduation Fee.—For all alike, $10.

Graduates of any reputable college are admitted to all the privileges of the matriculate, *save that of obtaining the degree*, on the payment of the annual dues as residents or non-residents. Such students after passing examination, may receive a special certificate, signed by the President of the University, for each study pursued.

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* No portion of the fees can be refunded to students who leave the University during the academic year, except by order of the Board of Regents.

The admission fee is paid but once, and entitles the student to the privileges of permanent membership in any department of the University. The annual tax is paid the first year, and every year thereafter.

There are neither dormitories nor commons connected with the University. Students obtain board and lodging in private families for from three to five dollars per week. Clubs are also formed, in which the cost of good board is from one dollar and a half to two dollars and a half per week. Room rent varies from seventy-five cents to two dollars per week for each student.

It is proper to say, in answer to numerous inquiries, that the University does not undertake to furnish manual labor to students; yet a considerable number of students find in the city opportunities for remunerative employment.

It is also proper to state that, in no seat of a prominent institution of learning in this country, are the necessary expenses of living and procuring supplies of every kind less than at Ann Arbor. Books, instruments, and all other appliances for the work of students are kept constantly on hand, and are afforded at as low prices as elsewhere.

IX. TEXT AND REFERENCE BOOKS.

ANATOMY.—Gray, Wilson. *For Reference.*—Sharpey and Quain.

HISTOLOGY.—Frey, Stricker, Rutherford.

MICROSCOPY.—Beale, Frey.

PHYSIOLOGY.—Flint, Dalton, Foster. *For Reference*—Flint, *larger work;* Carpenter, Todd's Cyclopœdia, Todd and Bowman, edited by Beale.

CHEMISTRY.—Barker, Roscoe, Bloxam, Douglas and Prescott's Analysis.

TOXICOLOGY.—Christison, Taylor.

PATHOLOGY.—Wagner (general), Bilroth (surgical), Paget, (surgical), Virchow, *Cellular Pathology.*

PATHOLOGICAL ANATOMY.—Wilks and Moxon, Jones and Sieveking, Rindfleisch, Orth. *For Reference.*—Wedl, Hasse, Rokitansky.

MATERIA MEDICA AND THERAPEUTICS.—*Lilienthal's Therapeutics.* Hughes's Pharmacodynamics; Herring's Condensed Materia Medica; Hull's Jahr; New Remedies, 2d edition; Hahnemann's Organon, Materia Medica Pura, Chronic Diseases; Allen's Encyclopedia; Hartmann's Homœopathic Remedies. *For Reference*—H. C. Wood, Bartholow, Stillé, Phillips, Ringer; Christison, or Taylor on Poisons; Harley's Old Vegetable Neurotics, Report of the Edinburg Committee on the Action of Mercury on theBiliary Secretion.

N. B.—Phillips and Ringer are especially recommended to such graduates as contemplate studying Homœopathy.

EXPERIMENTAL PATHOGENESY. *Hahnemann's Organon, Wesselhœft's Translation.* Brunton's Investigation of the Action of Medicines, Part I. Ott's Action of Medicines. *Handbook for the Physiological Laboratory, edited by J. Burdon-Sanderson. Manual of Chemical Physiology. Thudicum.*

OBSTETRICS.—*Guernsey, Leadam,* Meadows, Leishman, Tyler, Smith, Byford, Milne, Schrœder, Cazeaux, Hodge. *Special Subjects*—Tanner on Pregnancy, Barnes on Obstetric Operations, Elliott's Obstetric Clinic, Barker on the Puerperal Diseases.

DISEASES OF WOMEN.—Ludlam, Thomas, Byford, Hewitt, West, Barnes, Hodge. *Special Subjects.*—Klob on Pathological Anatomy of the Female Sexual Organs; Peaselee on Ovariotomy; Sims on Uterine Surgery; Emmet on Vesico-Vaginal Fistula.

DISEASES OF CHILDREN.—Hartmann, J. L. Smith, Vogel, Tanner, Meigs, Pepper, Hillier. *Special Subjects.*—Eustace Smith on the Wasting Diseases of Infancy and Childhood; Combe on the Management of Infancy; Routh on Infant Feeding; Holmes or Guersant on the Surgical Diseases of Children.

THEORY AND PRACTICE.—*Baehr,* Marcy and Hunt, Hughes, *Hartmann, Niemeyer,* Roberts, Flint. *For Reference.* Atkin, Reynolds, Trousseau, Graves, Ziemssen's Cyclopedia.

SURGERY.—*Franklin, Helmuth, Gilchrist's Therapeutics*; Erichsen, Hamilton, Druitt. *Special Subjects*—Franklin on Spinal Diseases, etc., Hamilton on Fractures and Dislocations; Bumstead on Venereal Diseases; Sayre on Club Foot; Sir Henry Thompson or Gouley on the Genito-Urinary Diseases and Surgery; Van Buren and Keyes on the Genito-Urinary Organs. *In Minor Surgery and Surgical Appliances.*—Bell, Le Gros Clarke, Anandale, Wales, Sargent, C. Henri Leonard on Bandaging. *For Reference*—Gross's System of Surgery; Holmes's System of Surgery.

N. B. The works whose titles are printed in Italics must be purchased *and used* by each matriculate.

OPHTHALMOLOGY AND OTOLOGY.—*On the Eye*—Sœlberg Wells, Stellwag, Carter, Metz. *On the Ear*—Roosa or Toynbee with Hinton's Supplement.

URINARY PHYSIOLOGY AND PATHOLOGY.—Harley, Hassall, Beale, Parkes, Thudicum, Neubauer and Vogel.

PHYSIOLOGICAL CHEMISTRY.—Brunton, (Handbook for the Physiological Laboratory), Thudicum (Manual of Chemical Physiology). *For Reference*—Lehmann's Physiological Chemistry.

The student, who is commencing a course of reading without an instructor, is recommended to devote the most of his time for the first year to the elementary branches, Anatomy, Physiology, and Chemistry, both general and medical; then advancing to the other studies to select one of the first mentioned text-books in each department, passing to the "*special subjects*" only when near the completion of the course, or as he may desire for particular reasons to become more fully informed on such subjects.

X. ASSIGNMENT OF SEATS.

Students on arriving in Ann Arbor can obtain the necessary information in regard to rooms, board, etc., by calling at the Steward's office. Seats in the Lecture rooms are assigned by selection to students in the order of registration on the Treasurer's books, and according to the class they are to enter; and each student is expected to occupy during the session such seat as may be assigned to him. In the advanced lectures the graduating class, by courtesy, are allowed the privilege of the seats nearest the operating table and lecture desk.

Letters of inquiry may be addressed to the "Dean of the Homœopathic Medical College," Ann Arbor, Michigan.

College of Dental Surgery.

I. ANNOUNCEMENT.

The fifth annual course of instruction in this College will commence on Wednesday, October 1, 1879, and continue till the last Wednesday of March, 1880, thus making a course of six months. There will be a recess of about two weeks during the holidays.

The term of instruction in the Medical Department is nine months; the students in the Dental College will therefore have an opportunity to continue their studies, especially in the collateral branches, till the last of June following, and this the Faculty strongly recommend.

There are five lectures daily during the regular course, and examinations are made upon the subjects presented.

The Dental students are required to attend all the lectures in the Medical College, unless excused by express permission.

It is for the interest of all, and especially of the students, that they be in attendance promptly at the beginning of the term. Seats are assigned in the order of matriculation, and the regular course of instruction commences promptly at the opening.

II. QUALIFICATIONS FOR ADMISSION.

Every candidate for admission must be eighteen years of age, and must present to the Faculty satisfactory evidence of a good moral character. Unless already a matriculate of the University, or a graduate of some respectable college. academy or high school, every candidate shall be examined as to his previous education, and his fitness for entering upon and appreciating the technical study of Medicine. The diploma or certificate of graduation from such institution must be presented to the Dean of the Faculty by the candidate in order to secure exemption from the examination, which will be in writing, and will embrace the ordinary branches of an English education.

Examinations will be held on Tuesday, September 30, 1879. Candidates are required to be present on the morning of this day, as they are expected to be in attendance on the first day of the term, at which time the regular course of instruction will commence. To provide for cases in which it is absolutely impossible for candidates to be present at this time, supplementary examinations will be held at such times as may be determined by the Faculty. Certificates of attendance are given for the actual period of attendance only.

Before admission to examination every student is required to present to the Dean of the Faculty the Treasurer's receipt for the payment of the matriculation fees and annual dues. It will therefore be necessary for the candidate to apply first to the Steward at his office in University Hall, register his name as a student in the Dental College, and pay his fees to the Treasurer. In case of rejection, the moneys paid preliminary to examination will be refunded by the Treasurer.

III. THE ADVANTAGES OF CONNECTION WITH THE UNIVERSITY.

The Department of Medicine and Surgery, long in successful operation, offers in full the facilities required for the satisfactory study of all branches common to General Medicine and this speciality. These facilities may be concisely enumerated as follows:

CHEMISTRY.

Recognizing the important part chemical agents and processes play in the workshop and operating room of the dentist and the marked influence they have in diseases of the teeth and associate parts, the students are required to attend the lectures on inorganic and organic chemistry, besides which they have the advantages of the Chemical Laboratory, for the practical study of all those agents or secretions that concern their future needs in the prevention and cure of disease:

The Laboratory is a building devoted exclusively to chemistry, furnished with all needed apparatus for any kind of research that may be required. For details of chemical work see pp. 63-65.

MATERIA MEDICA AND THERAPEUTICS.

Under this head will be brought in review all the remedial agents the dentist will need to use, with the fundamental principles which will guide their application in practice.

ANATOMY.

The groundwork of our science, the importance of which to the dental student cannot be over estimated, will be studied demonstratively and practically. Besides the full course on anatomy, which the student will attend with the medical class, special instruction will be given in the anatomy and histology of all that appertains to the oral apparatus. Thereby the dental student can become thoroughly acquainted with the region of his future professional practice, and in this he must actively participate to make his knowledge of these parts complete.

PHYSIOLOGY AND HISTOLOGY.

These subjects are fully considered and illustrated in their various aspects, and especially so far as they give light upon pathology. The importance of histological knowledge for the full comprehension of physiology is so fully recognized as to render necessary the establishment of a Laboratory in which all structures and tissues of the animal body may be studied in detail by the aid of the microscope.

Superior microscopes and all accessory apparatus and appliances requisite for the thorough prosecution of the work have been obtained.

A course in this Laboratory not only gives the student a knowledge of animal structures and tissues, but makes him familiar with the workings and uses of the microscope.

All candidates for graduation are required to take this course.

PATHOLOGY AND PRACTICE.

The instruction in Pathology and Practice of Medicine always thorough and exhaustive in regular medical lectures, will furnish ample means for becoming acquainted not only with the principles but with the details of practice.

SURGERY.

A complete course in this essential branch will fully meet the dentist's needs in the discussion and presentation of the surgical diseases, as well as the great underlying principles of surgical practice wherever applied.

DISEASES OF WOMEN AND CHILDREN.

Knowing how seriously the conditions of maternity and the provisions therefor often disturb the system, the dental student will be profited by instruction given in the obstetrical and allied lectures.

The diseases of children also, as affecting dentition, and as being affected by it, should receive special attention by the dental student. Opportunity for studying this subject will be given, and it must receive attention.

In short we consider the advantages which are offered by a fully equipped medical college of the first importance to the student of dental science, and we regard the attendance upon at least one entire course of medical lectures as the proper foundation for the subsequent study of a speciality. The student may here avail himself of all these facilities for a thorough education, in which the needs of a dentist will receive appropriate consideration.

IV. OPERATIVE DENTISTRY.

In this department will be presented the principles involved in the treatment of and operation upon the natural teeth and adjacent parts, for their preservation and restoration to health when diseased. This will embrace not only attention to the various affections of the teeth and contiguous parts, but the character and application of the special remedial agents, and the various approved methods of operating in all the details of condition, materials, instruments and appliances.

The student will be required to make his attainments thorough upon all these particulars, in order that he may never be at a loss for a guide in his treatment and manipulation.

V. CLINICAL.

In this department is given the most thorough practical instruction in the operative details, and in the preparation of the instruments and appliances used.

During the current session the demand for more room for the operative department became urgent. To meet this necessity, the Board of Regents ordered the erection of a building. This has been completed. We have a substantial brick structure, sixty-two feet long, twenty-four feet wide and two stories high. The second story is devoted to the operative department, and is most conveniently arranged and furnished. It has twenty-two large windows and space for twenty-five operating chairs.

The operating rooms are ample and well arranged, and fully supplied with all the requisite facilities, such as chairs, engines, etc. All valuable appliances will be made available, and instruction in their use given.

Every member of the Senior class, at least, will be required to spend a part of each day in the clinic room.

The opportunity and facilities for clinical instruction and experience are all that could be desired. Applications for treatment and operations have been far in excess of the requirements of the class. A very important consideration in this matter is that nearly all of those applying for services are persons who appreciate and value their teeth, and have been accustomed to receive the attention of skillful operators; in this fact is found a very desirable stimulus to the student, and one highly conducive to good order and decorum in the operating room.

VI. MECHANICAL DENTISTRY.

This department was without adequate accommodation for the enlarged class before the erection of the new building; that however, makes room for a class of at least one hundred. The room devoted to it occupies the entire lower story of the building, and is most complete in all its appointments. It contains every facility requisite for the prosecution of the student's work.

The instruction in this department will embrace everything that will enable the dentist to meet successfully the requirements in supplying substitutes for lost dental organs.

Special reference will be had to the principles involved in the restoration of natural enunciation and expression of features. Practical and valuable modes will be taught, and no time will be wasted upon worthless and obsolete styles.

Those who have Laboratory tools and appliances should bring them; those who have not, are advised to defer purchasing till they arrive at the college, as they will then have the aid of the teachers in making selections. Ample supplies will be at hand.

Special attention will be given to the manipulation and management of the precious metals with reference to their application to dental purposes.

VII. COURSE OF STUDY.

In the arrangement of this course of study it is the aim to make it such as will meet the requirements of the students and the expectation of the dental profession, and secure the greatest benefit to the public.

It is generally conceded that graded and progressive work promises the best results in education; and in accordance with that view, the following classification of studies has been adopted:

FOR THE JUNIOR YEAR.—Anatomy, including dissections, Physiology, Elementary Chemistry, Materia Medica, and Mechanical Dentistry. These branches must be studied by means of lectures, text-books and demonstrations. Members of the Junior class are expected to hear the lectures of the Senior course. Upon the branches above indicated the Juniors shall stand an examination at the end of the first term, or prior to entering the Senior class. The character of this examination will determine the admission to the Senior class. Prior to this examination each student shall make and deposit in the College an artificial denture that shall be approved by the teacher in that branch, and also present a satisfactory practical denture made by himself.

THE SENIOR YEAR—Shall embrace a review of the studies of the Junior year, Histology, Pathology, including Diseases of Women and Children, Therapeutics, General and Special Surgery, Analytical Chemistry, and Operative Dentistry.

In order to obtain greater proficiency a course of three years, embracing three sessions, is recommended. Such a course would occupy a session between the Junior and Senior years, an intermediate year. For those who take this course some modification of the present arrangement of studies will be made.

VIII. AIDS TO INSTRUCTION.

During this college year large and valuable additions have been made of imported preparations, embracing a series illustrating dentition from infancy to the completion of the process in the adult, and the normal changes through life to old age, and also illustrative of the dental and osseous tissues. Preparations, natural and artificial, greatly facilitate the study of the nervous and vascular system as well. The design is to make every practicable appliance in this direction available.

It is proper to state that, in addition to the above, the Museum of the Medical College, so well supplied with all things necessary for the medical student, is rich in material to aid the dentist. The museum is constantly used in illustrating lectures and is always open to students. The University Museum also contains more than 250,000 scientific specimens, and is accessible to all who desire its advantages.

The University Library is open daily, offering its advantages with about 2,000 volumes of medical literature to all who desire to use it, and a library of dental science, containing almost every known work on this speciality, is accessible to the students. Those who can command the time may also avail themselves of numerous lectures, or pursue elective studies, limited only by their capacity of appropriating what is abundantly offered.

IX. GRADUATION.

The candidate for graduation must be twenty-one years of age. He must furnish evidence of good moral character. He must have devoted three years to the study of his profession, and have made such attainments in all the branches of the course of study herein indicated as shall be satisfactory to the Faculty. He must attend two full courses of lectures in the Dental College, or one course elsewhere, and the last one here, and we recommend that he attend these courses regularly. He must pursue the study of Chemistry in the Laboratory, or sustain an examination in the studies there pursued. He must submit to the Faculty a thesis upon some subject of his course or upon some practical case which he shall have brought to a successful termination by his own effort. He must present for inspection practical operations prepared by himself in the College, and give evidence of his skill and ability in treating those derangements which may be submitted to his care. He must sustain an examination satisfactory to the Faculty in all the branches taught.

A graduate of the Medical College may enter the Senior class, and, if found qualified, may graduate after one year has been devoted exclusively to the study of Dentistry.

X. TEXT-BOOKS.

OPERATIVE DENTISTRY.—Taft's Operative Dentistry, Harris's Principles and Practice of Dental Science, Tomes's Dental Surgery, Harris's Dictionary of Dental Surgery.

MECHANICAL DENTISTRY—Richardson's Mechanical Dentistry.

For books of reference on medical subjects see page 81.

XI. FEES AND EXPENSES.

The fees, which must be paid in advance, are as follows:

RESIDENTS OF MICHIGAN.—Matriculation fee, $10; annual dues, $20.

NON-RESIDENTS.—Matriculation. $25; annual dues, $25.

GRADUATION FEE.—For all alike, $10.

The admission fee is paid but once, and entitles the student to the privileges of permanent membership in any department of the University. The annual fee is paid the first year, and every year thereafter while in attendance at the University.

For further details concerning expenses, see pp. 21-22.

A CATALOGUE

OF

FACULTIES AND STUDENTS

IN THE

UNIVERSITY, 1878-9;

PRECEDED BY

A LIST OF THE GRADUATES OF 1878.

DEGREES CONFERRED IN 1878.

PHARMACEUTICAL CHEMIST.

Frank Atwood Brooks,
Hulett White Calkins,
Alexandrine Egeroff,
Elbridge Dayton Gibson,
William Andrus Hasbrouck,
Henry Heim,
Cyrus Wellard Heister,
Oscar Herman Koehnle,
Hugo Lorens Lupinski,
Theodore Fred Meyer,
John Johnston Miller,
Lucius Wright Moody,
Louis Ernest Seyffardt,
Amasa D. Smith,
Ellery Spencer,
Henry Stecher,
Hugo Thum,
Perry Leland Townsend,
Robert Henry Wallace,
George E. Wilson,
Clinton Edwin Worden,
Theo. John Wrampelmeier.

MINING ENGINEER.

Walter Scott Abell,
Henry Wick Judd,
Eugene George Mann,
Sydney Buckminster Wight.

CIVIL ENGINEER.

George Franklin Allmendinger,
Clarence Oliver Arey,
James Dick Du Shane,
William V. Grove,
John K. Hanson,
John Butler Johnson.
Timothy Josenhans,
Seymour Tenny Morse,
Charles Fernando Owen,
James Sanderson,
Ossian Cole Simonds,
Frank Leonard Sizer,
Hiram Everett Terry,
Evert Van Pelt,
Andrew Wenzell.

BACHELOR OF SCIENCE.

Charles Emerson Beecher,
Paul Henry Hanus,
Horace Greeley Myers,
Jay Junius Read,
Louis K. Webb.

BACHELOR OF PHILOSOPHY.

Daniel Ayres Allen,
Marion Benjamin Allen,
Charles Malcolm Cooley,
John Herbert Edwards,
Charles Edwin Garner,
Watson Dexter Hinckley,
William Claflin Johnson,
Albert James Norton,
Ross Wilkins.

BACHELOR OF ARTS.

Alexis Caswell Angell,
Walter Wheaton Augur,
Florus Alonzo Barbour,
Minnie Bary,
Cora Agnes Benneson,
William Henry Butts,
Mary Emma Byrd,
Eva Chandler,
J. Rose Colby,
Webster Cook,
Michael Buchanan Danaher,
Charles M. Daugherty,
David Noble De Tarr,
Randall P. W. Fleming,
Franklin Garrison,
Charles Mills Gayley,
Clarence Griggs,
George Hatfield Harrower,
George Horton,
Edward King Hubbard,
Jerry Whipple Jenks,
William Lee Jenks,
George Wells Knight,
Howell C. Moore,
Harry Pierce Myrick,
Annie Smith Peck,
Charles Kendall Perrine,
James Hervey Raymond,
Albert William Ryan,
Orr Schurtz,
James Truman Shaw,
Douglas Houghton Stringham,
Sarah Elizabeth Swift,
Cora Ilione Townsend,
Stuart Douglas Walling,
Horace Bailey Wamsley,
Andrew Whitehead,
George Spencer Willits,
Theo. John Wrampelmeier.

MASTER OF PHILOSOPHY. [ON EXAMINATION.]

Mary Emma Farrand, Ph. B., 1877.

MASTER OF ARTS [ON EXAMINATION.]

Arthur Gordon Oven, B. A., 1875.

DOCTOR OF PHILOSOPHY [ON EXAMINATION.]

Abram Sager Hall, Ph. B., 1876; Ph. M., 1877.

DOCTOR OF MEDICINE [DEPARTMENT OF MEDICINE AND SURGERY.]

George W. Allyn, M. A.,
Robert William Alton,
Frank Eugene Andrews,
Charles Orrin Baker, M. A.,
Henry J. Banta,
Jennie S. Barnard,
Jerome William Barnard,
Howard Malcom Bennett,
Asa Lapham Blanchard,
Patrick Brennan,
Phebe Brooks,
Nellie A. Brown,
J. Neelands Buckham, P. C.,
William Early Burtless,
John Dalgliesh Campbell,
Absalom Winfield Jones, M. A.,
Titus Dixon Keillor,
E. Olin Kinne, Ph. B.,
William Frederick Knapp,
Charles Sumner Knight,
John Joseph Lawless,
Edgar Dudley Lewis,
William H. D. Lewis, P. C.,
Adelaide Lewitt,
Damon Morgan Little,
George Henry Littlefield, B. A.
J. Harvey Lyon,
Thomas M. Marcellus,
Alfred George Mays, P. C.,
Robert McGurk,

Tareh H. Choolhaian, B. S.,
Thomas Canning Church,
John E. Conlan,
Richard W. Corwin,
Carter J. Crippen,
Thomas Allen Cullis,
Charles Edward Dampier,
John Davidson,
Edward Van Ness Davis,
Lyman Deck,
Emma A. Decker,
Wilhelmus Decker, B. S.,
Alexandrine Egeroff, B. S.,
Clara M. Ellsbury,
William Brown Ely,
Henry A. Fitch, P. C.,
John R. Francis,
Charles Walter Gardner,
Julius Garst,
Lowell M. Gates, B. S.,
Frank B. Golley,
George Garrett Gordon,
Charles H. Gumaer,
Lucy Mabel Hall,
Hamlet Hart,
George Nicholas Hartwell,
Robert Henderson,
Frank Pierce Herr,
James Simpson Herries,
Horace Rodney Hitchcock,
Frank C. Horner,
Oliver Nixon Huff,
Omar Persha Huston,
Victor Hugo Jackson, D. D. S.,
Charles Henry McKain,
John A. McLeod,
Neil McLure,
Norman Lamont McLachlan,
Duncan F. McMillan,
Eugene H. Mead,
Alpheus Goodman Mesic,
George G. Monroe,
Allen Nelson Moore,
Lyman S. Osborne,
Charles Doolittle Parsons,
Levi Augustus Proper,
George Henry Randall,
Alexander McCandless Reed,
Delbert E. Robinson,
Benjamin Levan Saeger,
John Chester Salmon,
William Lewis Shoals,
Floyd Preston Sheldon,
Warren Hobart Sherman,
Charles Gilbert Smith,
Eli James Smith,
George Warren Spencer,
Ransom H. Stevens, P. C.,
George Mitchell Swain, Jr.,
Lavinia Todd,
Charles C. Van Valkenburg,
Victor C. Vaughan, Ph. D.,
John W. Was,
William Joshua Webb,
Silas Addison Wessel,
Nathan H. Williams,
John L. White, Ph. B.,
William Elwood Ziegenfuss.

BACHELOR OF LAWS.

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James M. Ashley, Jr., B. S.,
Warren Ashley,
Loraine Ashman,
Charles Albert Barnes,
Robert Pollock Barr,
Morris C. Baum,
Thomas Cornelius Logan,
Alfred Edward Lucking,
Patrick William Magrath,
Albert Eugene Mason,
Ovid Luther Matthews,
Calvin Leonidas May,
James Henry McDonald, B. A.,

Carlton Abbey Beardsley,
George Frederick Bedford,
William James Black, M. S.,
B. Frank Bower,
Frank Gilbert Bohri,
James McCampbell Boyd,
Archer Briggs,
Henry Monroe Campbell, Ph. B.,
Frank L. Carpenter, B. S.,
William Leland Carpenter, B. S.,
William Carter, Jr.,
Jacob Catlin Clark,
Joseph Burton Connell, Ph. B.,
Charles Conner,
Eugene M. Converse,
Warren J. Cook,
William Henry Cook,
Zimri Lonzo Cooper,
Byron J. Corbin,
Charles Arthur Couillard,
William Alfred Crandall,
John Milton Davis,
Frank Fremont Dawley,
Le Burget Des Voignes,
Edward Donovan, B. S.,
Anderson Simpson Dwyre,
Bessie Eaglesfield, B. A.,
Herbert Van Allen Ferguson,
John Everett Finke,
John Owen Garrett, M. S.,
General George Gates,
Jeremiah Wright Gladish,
Louis P. C. Godfrey,
William Goodell,
Fred Harry Gould, C. E.,
Thurston Pierce Hackleman,
Henry Allen Haigh, B. S.,
Charles Edward Hale, M. S.,
Joel Warren Hamilton,
Henry Hanaw,
Harry Philip Hancock,
John Hanitch,
Abner Kellogg Hayward,
J. Bob McGuffin, B. A.,
Ambrose Peter McGuirk,
William Newberry Moore,
Justus Tillman Neff,
Charles Campbell Nelson,
Frederick Thomas Nunn,
Julius Sinclair Ogan, B. A.,
William O'Reilly,
Herman Henry Osthaus, M. A.,
Joel Webster Page, Jr.,
George E. Pantlind, C. E.,
Alfred Noble Paxton,
Franklin Pierce Payne,
Edwin Zina Perkins,
Syrus G. D. Phelps,
Eugene Douglas Pierson,
James McMillan Powers,
Franklin Henry Pray,
Daniel Edward Prescott,
Eugene E. Prussing,
Charles Morgan Randolph,
Herbert Stanley Reed,
Daniel Clark Remick,
Daniel Smith Remsen,
Henry Kendall Rhoades,
Thomas Rinaker, B. A.,
Herman Ritter,
Charles Humphrey Roberts,
Hans Frederick Rhode,
Joseph Charles Royan,
Frank Finley Rozzelle, B. S.,
Wilbur Fremont Rudy, B. A.,
Kingpay Saito, B. S.,
Charles James Sawbridge,
Horace Bigelow Schaeffer,
George Henry Sleator,
Benjamin Franklin Smith,
Charles William Smith, B. A.,
George Smith,
Howard Burnham Smith, B. A.,
Samuel William Smith,
James Alonzo Stacy,
Howard Stephenson,

Joseph Hidy, Jr., Ph. B.,
Walter Bunyan Hill, B. A.,
Henry Hoffman,
Clayton John S. Hoover,
Abram F. Hostetter,
Enoch Thatcher Howes,
Eugene Ralph Hutchins, Ph. B.,
Charles Sumner Ingersoll, B.S.,
Frederick Gerard Ingersoll,
Wooster Morrow Ireland,
James Washington Johnston,
William Allen Johnston, B. A.,
Samuel Clark Jones,
John Culbertson Keith,
John Caldwell Kirkpatrick,
Wilfred Ivanhoe Klein,
Jerome Cyril Knowlton, B. A.,
Elbert Le Roy Lampson, B. S.,
Victor Hugo Lane, C. E.,
Nathaniel Benjamin Landon,
Charles Newcomb Lauman,
Frank Barbour Lay,
Myron W. Lee,
Henry Lindner,
Jeremiah Lou. Suddarth,
William Dawson Talbot,
Henry Gee Taylor,
John Warren Taylor,
Alden Stewart Thompson,
John Alexander Tindall, B. S.,
Henry Stever Tremper, B. A.,
Junichi Ukizumi Tsuda,
Isaac M. Turner,
Samuel W. Vance,
Claudius Damont Walker,
Myron Hamilton Walker,
Warren Edwin Walker,
Willis Shotwell Walker, B. A.,
George Proctor Wanty,
Alvin C. White, M. S.,
John Stewart Whitford,
Smith Newell Wilbur,
Fred Potter Wilcox, B. A.,
John Henry Wishek,
Gustave Adolph Wolfe,
Henry Wollman,
James Robert Wylie,
William Yost, B. A.

DOCTOR OF MEDICINE. [HOMŒOPATHIC MEDICAL COLLEGE.]

Amelia Martha Atkins,
Aaron B. Avery,
James Douglas Baker,
Sarah J. Coe,
Horace Marvin Corey,
Clark De Muth,
William Alvord Franklin, Ph. B.,
Merritt Eugene Graham,
Edward Everett Hoit,
William B. Knapp, M. D.,
John Mallory Lee,
Samuel Stewart Moffatt,
John Summerfield Martin,
Israel Ohlinger,
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William Henry Butts, B. A.,	*University of Michigan,*	Ann Arbor.
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Anson Peter De Wolf, B. A.,	*University of Michigan,*	Prairieville.
William Taylor Jackson, B. D.,	*Yale Theo. Seminary,*	Lafayette, Ind
Jerry Whipple Jenks, B. A.,	*University of Michigan,*	Sand Beach.
Timotheus Josenhans, C. E.,	*University of Michigan,*	York.
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Barclay Tennyson Trueblood, B. S.,	*Whittier College, Iowa,*	Oskaloosa, Ia.

CANDIDATES FOR DEGREES.

FOURTH YEAR.

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William Livingston Axford,	L.	*Holly.*
Edward Playfair Anderson,	Cl.	*Ottawa, Kan.*
Erastus Albert Barnes,	Cl.	*Owosso.*
Joseph Allen Beaumont,	Eng.	*Peru, Ind.*
Fred Somers Bell,	L.	*Fort Dodge, Iowa.*
Mary Lavina Blood,	Cl.	*Waltham, Mass.*

NOTE.—Candidates for degrees who have completed without conditions eighteen Full Courses are ranked as Fourth Year Students; those who have so completed twelve Full Courses, as Third Year Students; those who have completed six Full Courses as Second Year students; all others as First Year students. The abbreviation Cl. (Classical) after the name of a student indicates that he is a candidate for the degree of B. A.; L. (Latin) for Ph. B., (or after 1881, B. L. Latin); Sc., B. S.; Eng. Civil Engineer, (or after 1881, B. S.); M. Eng., Mining Engineer, (or after 1881, B. S.); B. L., Bachelor of Letters.

NAME.	DEGREE.	RESIDENCE.
James Padelford Brown,	L.	*Milwaukee, Wis.*
Hubert William Brown,	Cl.	*Ann Arbor.*
William Foster Bryan,	Cl.	*Lafayette, Ind.*
Carina B. Campbell,	Cl.	*Monroe.*
Richard Turner Chandlee,	Sc.	*Ann Arbor.*
John Chase,	Cl.	*Ann Arbor.*
Edmund Adolph Christian,	Cl.	*Wyandotte.*
Frantz Hunt Coe,	Cl.	*Ann Arbor.*
Chauncey Ferris Cook,	Cl.	*Hillsdale.*
Richard Gay De Puy,	Cl.	*Ann Arbor.*
Laura Donnan,	Cl.	*Indianapolis, Ind.*
Fannie Clinton Farrand,	Cl.	*Ann Arbor.*
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Isaac Channing Goff,	Eng.	*Cleveland, O.*
William Albert Greeson,	Cl.	*Alto, Ind.*
Leroy Halsey,	Cl.	*Chicago, Ill.*
Frank Dwight Haskell,	Cl.	*Ann Arbor.*
Charles Sumner Henning,	Eng.	*Plano, Ill.*
Cicero Demerit Hill,	Eng.	*Milwaukee, Wis.*
Edward Walter Jenney,	Cl.	*Chicago, Ill.*
Brayton Daniel King,	Eng.	*Ann Arbor.*
Maya Violet Lee,	Cl.	*Lancaster, N. Y.*
Lorenzo John Locy,	Sc.	*Flint.*
James Wilfred McKinley,	Eng.	*New Castle, Pa.*
Newton McMillan,	Cl.	*Ann Arbor.*
Frank Day Mead,	Cl.	*Ann Arbor.*
Jesse Fonda Millspaugh,	Cl.	*Battle Creek.*
H. Throop Morley,	M. Eng.	*Marine City.*
Mark Norris,	L.	*Grand Rapids.*
Albert Samuel Pettit,	Cl.	*Ann Arbor.*
James Elijah Pilcher,	Cl.	*Detroit.*
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John Charles Quintus,	M. Eng.	*Grand Rapids.*
John Ross Russell,	Cl.	*Detroit.*
Spencer Ramsey Smith,	Cl.	*Fort Wayne, Ind.*
Kenneth Russell Smoot,	Cl.	*Ann Arbor.*
John Hubbard Tweedy, Jr.,	Cl.	*Milwaukee, Wis.*
Lucius Lincoln Van Slyke,	Cl.	*Pike, N. Y.*
Charles Gilbert Van Wert,	L.	*Norvell.*
Elmer Randolph Webster,	Cl.	*White Lake.*
E. Fred Wood,	M. Eng.	*Ann Arbor.*
George Deming Wright,	Cl.	*Fenton.*

THIRD YEAR.

NAME.	DEGREE.	RESIDENCE.
John Jacob Abel,	L.	*Cleveland, O.*
John Ayres,	Eng.	*Fort Smith, Ark.*
Charles Spencer Beadle,	Eng.	*Hastings.*
Michael Henry Brennan,	L.	*Ann Arbor.*
John Marion Brewer,	Cl.	*Romeo.*
Charles Carroll Brown,	Eng.	*Indianapolis, Ind.*
Edward Miles Brown,	L.	*Schoolcraft.*
Isaac Howard Bullock,	Cl.	*Kelton, Pa.*
Arthur William Burnett,	Cl.	*Tecumseh.*
Charles Hotchkiss Campbell,	L.	*Detroit.*
Kate Ellis Coman,	L.	*Hanover, O.*
William Wilson Cook,	Cl.	*Hillsdale.*
J. C. Waterson Cowley,	Cl.	*Pontiac.*
Ismena Cramer,	L.	*Ann Arbor.*
Lewis Franklin Culver,	Cl.	*Quincy.*
Andrew Strong Deacon,	Eng.	*Harrisonville, Mo.*
Charles Levi Dubuar,	Cl.	*Northville.*
Oren Dunham,	L.	*Toledo, O.*
Thomas Randolph Edwards,	L.	*Ann Arbor.*
John Thomas Ewing,	Cl.	*Ann Arbor.*
Jay Fuller,	L.	*Buchanan.*
Mary Henrietta Graham,	L.	*Ann Arbor.*
Charles Howard Greathouse,	Cl.	*Uniontown, Ky.*
John Alexander Green,	Cl.	*Austin, Texas.*
Thomas C. Greene,	L.	*Troy, N. Y.*
Frederick James Gurney,	Cl.	*Chicago, Ill*
Norman Washington Haire,	Cl.	*Leslie.*
William Washington Hannan,	Cl.	*Dowagiac.*
Thomas Lorenzo Heaton,	L.	*Potsdam, N. Y.*
William Helmle,	Cl.	*Springfield, Ill.*
George Hempel,	Cl.	*Ann Arbor.*
William Cary Hill,	Cl.	*Ann Arbor.*
Charles William Hitchcock,	Cl.	*Kalamazoo.*
William Henry Honey,	Cl.	*Ypsilanti.*
Ledru Rollin Hunter,	Cl.	*South Lyon.*
Frank Arthur Johnson,	Cl.	*Ann Arbor.*
William Kemper Jones,	Cl.	*Grand Rapids.*
Fred Parker Jordan,	Cl.	*Battle Creek.*
James R. Laing,	Sc.	*Ann Arbor.*
Peter Burr Loomis, Jr.,	Cl.	*Jackson.*

NAME.	DEGREE.	RESIDENCE.
Frank Wood Loveland,	Sc.	*Golden, Col.*
William Wesley Lowrey,	Cl.	*Hackettstown, N. Y.*
Charles King McGee,	Cl.	*Jackson.*
Charles Sumner Mitchell,	L.	*St. Cloud, Minn.*
Carrie Cook Parrish,	Cl.	*Ann Arbor.*
Cyrus Augustus Pomeroy,	Cl.	*Ann Arbor.*
Allen Bartlit Pond,	Cl.	*Ann Arbor.*
Frances Anna Prentiss,	Cl.	*Bay City.*
Stella Prince,	Cl.	*Jacksonville, Ill.*
Harry Slade Richards,	L.	*Paw Paw.*
Arthur Raymond Rood,	L.	*Lapeer.*
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J. Warren Smith,	Cl.	*Eaton Rapids.*
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Malcolm Parker Thomas,	Cl.	*Schoolcraft.*
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Alice Van Hoosen,	Cl.	*Rochester.*
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William Dow Washburn,	Cl.	*Platteville, Wis.*
Charles Chase Whitacre,	L.	*Chicago, Ill.*
Enoch Clark White,	Cl.	*Lapeer.*
John Haven Willard,	L.	*Chicago, Ill.*
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Charles Moseman Wilson,	L.	*Ionia.*

SECOND YEAR.

NAME.	DEGREE.	RESIDENCE.
Josiah Little Ambrose,	L.	*Chicago, Ill.*
Martha Elizabeth Arnold,	L.	*Detroit.*
Richard Bayard Bancroft,	L.	*Port Huron.*
Samuel Lloyd Beaumont,	M. Eng.	*Ann Arbor.*
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Frank Pardee Boughton,	Cl.	*Battle Creek.*
Edward Harvey Bowman,	Cl.	*St. Charles, Ill.*
Edward Miles Brown,	L.	*Schoolcraft.*
Claude Robinson Buchanan,	Cl.	*Grand Rapids.*
George Noble Carman,	Cl.	*Fenton.*

NAME.	DEGREE.	RESIDENCE.
Samuel Chandler,	Cl.	*Ann Arbor.*
Thomas Collier Clark,	L.	*Ann Arbor.*
Charles Henry Cole,	Cl.	*Ann Arbor.*
Nellie May Colman,	Cl.	*Ann Arbor.*
Arthur B. Cook,	Cl.	*Flint.*
William Wilson Cook,	Cl.	*Hillsdale.*
Rufus Crippin,	Cl.	*Ypsilanti.*
Isaiah Reed Crossette,	Cl.	*Three Rivers.*
George Brown Daniels,	Cl.	*Grand Rapids.*
Eliza Darling,	L.	*La Porte, Ind.*
Benjamin Leonard D'Ooge,	Cl.	*Grand Rapids.*
Jane Eyer,	Cl.	*Highland Park, Ill.*
George Henry Fletcher,	Cl.	*Mankato, Minn.*
Duane Edwin Fox,	Cl.	*Grand Rapids.*
Allan Howard Frazer,	L.	*Detroit.*
William Galpin,	Cl.	*Ann Arbor.*
Anna Bordwell Gelston,	L.	*Ann Arbor.*
Fred Harris Goff,	L.	*Cleveland, O.*
Charles Watson Goodrich,	Cl.	*Milwaukee, Wis.*
Nat Gunter,	L.	*Sherman, Texas.*
Arthur Gillespie Hall,	Cl.	*Cazenovia, N. Y.*
William Simon Hill,	Cl.	*Oxford.*
John Flavel Hinman, Jr.,	Cl.	*Battle Creek.*
Herbert Augustus Hodge,	M. Eng.	*Concord.*
David Emery Hoover,	Eng.	*Ionia.*
Maurice Meir Houseman,	L.	*Grand Rapids.*
Delia Estelle Howe,	Cl.	*Lansing.*
James Edmund Hunt,	Cl.	*Toledo, O.*
Ormond Fremont Hunt,	Cl.	*Ann Arbor.*
Wetmore Hunt,	L.	*Detroit.*
Charles Hutchinson,	L.	*Marshall.*
Edward Israel,	Cl.	*Kalamazoo.*
Collins Hickey Johnston,	Cl.	*Detroit.*
John Kelley, Jr.,	Cl.	*Detroit.*
Homer Hitchcock Kingsley,	Cl.	*Kalamazoo.*
Charles Hannibal Kumler,	Cl.	*Dayton, O.*
George Anthony Lederle,	Eng.	*Detroit.*
W. Leigh Liggett,	Cl.	*Detroit.*
William Albert Locy,	Cl.	*Flint.*
Alice Mansfield,	Cl.	*Coldwater.*
Milton Mozart Marble,	Cl.	*Ann Arbor.*
David McKenzie,	Cl.	*Detroit.*

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Alice Jane Merritt,	L.	*Wilson, N. Y.*
William Clayton Miller,	Eng.	*Marquette.*
Margaret E. Morton,	Cl.	*Ann Arbor.*
Eugene C. Nardin,	L.	*Belle Branch.*
Leroy Stephen Norton,	L.	*Shabbona, Ill.*
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Horace Mann Oren,	Cl.	*Indianapolis, Ind.*
Frank Russell Osborn,	Cl.	*Vandalia.*
Moss Kent Perkins,	Cl.	*Ann Arbor.*
Albert J. Potter,	Cl.	*Niles.*
Henry Sherring Pratt,	Cl.	*Toledo, O.*
Frank Fremont Reed,	Cl.	*Ann Arbor.*
Rowland Henry Rerick,	Sc.	*Lagrange, Ind.*
Harry Chase Richardson,	Cl.	*Princeton, Ill.*
Frank Carle Robbins,	Cl.	*Niles, O.*
Louis Sax,	Cl.	*Milwaukee, Wis.*
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Osman Cooley Seelye,	Cl.	*Ann Arbor.*
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Samuel Edwin Wheat,	Cl.	*Leavenworth, Kan.*
Will Turner Whedon,	L.	*Ann Arbor.*
Asa Devillo Whipple,	Cl.	*Fowlerville.*
Edwin Kirby Whitehead,	Cl.	*Coldwater.*
Everett Jerome Whitehead,	Cl.	*Fenton.*
Louis Davenport Wight,	Sc.	*Detroit.*
Samuel Lane Williams,	Cl.	*Lapeer.*
Charles Gaston Wilson,	M. Eng.	*Sturgis.*
Frederick Bissell Wood,	L.	*Tecumseh.*
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Wilder Mack Wooster,	Cl.	*Decatur.*
Max Zinkeisen,	Cl.	*Milwaukee, Wis*

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Hattie May Bailey,	B. L.	*Grand Rapids.*
Julian William Baird,	Cl.	*Jackson.*
Frank Elisha Baker,	Cl.	*Goshen, Ind.*
Edward Hubert Barmore,	Eng.	*Jeffersonville, Ind.*
Samuel Willard Beakes,	Cl.	*Bloomingburgh, N. Y.*
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Charles Belmont,	Cl.	*Boston, Mass.*
Brayton Seeley Bennett,	Cl.	*Salem.*
Edward McElroy Benson,	Cl.	*Detroit.*
Lillian Margaret Berkey,	Cl.	*Grand Rapids.*
Fred Betts,	Cl.	*Hillsdale.*
Willis Boughton,	Cl.	*Sheffield, Ill.*
Charles Taylor Brace,	Cl.	*Leavenworth, Kan.*
Merle Amos Breed,	Cl.	*Ypsilanti.*
Benjamin Pitcher Brodie,	Cl.	*Detroit.*
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Edward Henry Bull,	L.	*Ottawa, Ill.*
Ada Bunnell,	Sc.	*Bay City.*
Milie Bunnell,	Sc.	*Bay City.*
Henry James Butler,	L.	*Lionville, Pa.*
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George Lamont Chubb,	Sc.	*Grand Rapids.*
John Charles Chynoweth,	M. Eng.	*Rockland.*
William Matthew Clapp,	Sc.	*Detroit.*
Frances Clark,	Sc.	*Flint.*
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William L. Clements,	Sc.	*Ann Arbor.*
Charles Lewis Coffin,	M. Eng.	*Sandusky, Ohio.*
Fred G. Coldren,	Cl.	*Northville.*
Edwin Locke Cole,	Sc.	*Ann Arbor.*

NAME.	DEGREE.	RESIDENCE.
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Sumner Collins,	Cl.	*Macon.*
Daniel Wolford Cook,	Cl.	*Hillsdale.*
Chester Emory Coulter,	B. L.	*Shannon, Ill.*
Morris Levi Courtright,	L.	*Bay City.*
Mittie May Curtis,	Cl.	*Ann Arbor.*
Grace Darling,	L.	*LaPorte, Ind.*
Frank William Davenport,	L.	*Eureka, Ill.*
John J. Crittenden Davis,	Cl.	*Davisburg.*
Mary W. Dawson,	Cl.	*Pontiac.*
Francis Root Day,	Eng.	*Chicago, Ill.*
George Edward Dean,	B. L.	*Huntingville, P. Q.*
John Philander Delphy,	L.	*Erie.*
William Freeman Dodge,	Sc.	*Ionia.*
Benjamin Douglas,	Sc.	*Detroit.*
Charles Howard Durham,	Cl.	*Ravenna, O.*
Samuel Houston DuShane,	L.	*Connellsville, Pa.*
Ellen Eastman,	B. L.	*Flint.*
Malcomb Woodworth Edgar,	L.	*Tecumseh.*
William Edward Fenwick,	L.	*Detroit.*
Henry Allen Fitzsimmons,	Cl.	*Reading.*
Allan Miller Fletcher,	L.	*Detroit.*
William W. Follett,	Eng.	*Newfane, N. Y.*
Maurice Pixley French,	L.	*Milwaukee, Wis.*
James Frederick Gallagher,	Cl.	*Hillsdale.*
Arthur Mills Gelston,	Cl.	*Ann Arbor.*
Marcia Gilmore,	L.	*Denver, Col.*
William Herbert Graham,	Cl.	*Grand Rapids.*
John Henry Grant,	Cl.	*Burlington, Ind.*
Henry Ballard Graves,	L.	*Battle Creek.*
Harry Parker Gray,	Cl.	*Grayville, Ill.*
Robert Toms Gray,	L.	*Detroit.*
Effie Griffith,	L.	*Greenville.*
Albert Barlow Hale,	Cl.	*Chicago, Ill.*
Ferdinand Hall,	Eng.	*Westfield, N. Y.*
Sadie Guest Hamilton,	L.	*Jacksonville, Ill.*
Mary Lucy Harding,	L.	*Detroit.*
Mary Haskell,	L.	*Marshall.*
John Evangelus Hathaway,	Eng.	*Milwaukee, Wis.*
Mary Hegeler,	M. Eng.	*Lasalle, Ill.*
George Edwin Herrick,	Cl.	*Grand Rapids.*
James Bryan Herrick,	Cl.	*Oak Park, Ill.*

NAME.	DEGREE.	RESIDENCE.
Alice Hill,	Cl.	*Battle Creek.*
Laura Caroline Hills,	L.	*Lake View, Ill.*
E. Harold Hilton,	Cl.	*Ann Arbor.*
Charles Henry Hodges,	Sc.	*Detroit.*
George Nash Holland,	Sc.	*East Saginaw.*
Abbie Euretta Howe,	Cl.	*Ypsilanti.*
Phebe Ann Isadore Howell,	Cl.	*Ionia.*
Louis Howard Hyde,	L.	*Joliet, Ill.*
Jesse Allen Icenhour,	L.	*Columbiana, O.*
Charles Edward Ilsley,	L.	*Milwaukee, Wis.*
James H. James,	M. Eng.	*Rockland.*
William Robert Johnson,	Cl.	*Steubenville, O.*
Charles Collins Kellogg,	B. L.	*Detroit.*
DeForest Kendall,	Cl.	*Terre Haute, Ind.*
Annie Marie Kimball,	Cl.	*Grand Rapids.*
Howard Hannibal Kimball,	Eng.	*Columbus, O.*
Frank Bruce Leland,	Cl.	*Byron.*
John Jacob Lentz,	Cl.	*St. Clairsville, O.*
Clarence Ashley Lightner,	Cl.	*Detroit.*
Eugene Frank Lohr,	L.	*Pittsfield.*
William Leonard Loveland,	B. L.	*Golden, Col.*
Henry Symms Mahon,	L.	*Framingham, Mass*
William L'Estrange Mahon,	L.	*Framingham, Mass*
Maria McDonald,	B. L.	*Rochester.*
William Hunter McEwan,	Eng.	*Bay City.*
John Emmett McGill,	Sc.	*Plymouth.*
Charles Henry McIntyre,	L.	*Flint.*
Andrew Cunningham McLaughlin,	Cl.	*Muskegon.*
Frank Chittenden Mandell,	Cl.	*Detroit.*
Everett Marshall,	Eng.	*Cleveland, O.*
William Elmore Martin,	L.	*Milwaukee, Wis.*
William Hosmer Mitchell,	Cl.	*Port Huron.*
Walter Emerson Moore,	Cl.	*North Branch.*
Harry Morrow Musgrave,	Cl.	*Charlotte.*
Alma Zilpha Muzzy,	L.	*Modena, Wis.*
David Sealy Naugle,	Cl.	*Beaver Falls, Pa.*
James Hill Norton,	B. L.	*Harwich, Mass.*
Ralph Waldo Oakley,	L.	*Detroit.*
Rollo Blakesly Oglesby,	L.	*Plymouth, Ind.*
Alton William Onthank,	Sc.	*Portland, N. Y.*
Frank Lincoln Osborn,	Cl.	*Tecumseh.*
Edward Henry Ozman,	Cl.	*Rochester, Minn.*

NAME.	DEGREE.	RESIDENCE.
Edward Leroy Parmenter, Jr.,	Cl.	*Menominee.*
Herbert Maury Pelham,	Sc.	*Plymouth.*
Robert Quinn,	Cl.	*Negaunee.*
Charles John Reed,	Cl.	*Morris, Ill.*
Jacob Ellsworth Reighard,	L.	*La Porte, Ind.*
William Douglas Robbins,	Cl.	*Tecumseh.*
Frederick Austin Robinson,	Cl.	*Detroit.*
Charles Robinson Rockwood,	Sc.	*Flint.*
Thornton William Sargent,	Cl.	*Piketon, O.*
Wilfrid Hamilton Schuyler,	L.	*Ann Arbor.*
Henry Gray Sherrard,	Cl.	*Tecumseh.*
Bowen Wisner Shoemaker,	Cl.	*Jackson.*
Samuel Balsom Schoyer,	Cl.	*Pittsburgh, Pa.*
Lizzie M. Simmons,	Sc.	*Ann Arbor.*
Homer Adelbert Skidmore,	Cl.	*Rose Centre.*
John McMunn Smith,	L.	*Charlotte.*
Margaret Elsie Smith,	B. L.	*Bay City.*
Hinton Ellsworth Spalding,	Cl.	*Gallipolis, O.*
Henry Hall Spencer,	Cl.	*Richland.*
George Walter Staple,	Cl.	*Cleveland, O.*
Robert Douglas Stephens,	B. L.	*Mount Clemens.*
Adelbert C. Storey,	L.	*Greenville.*
William Streeter,	Cl.	*Quincy.*
Jennie Sweetzer,	Cl.	*Port Huron.*
Thomas Carlyle Tate,	Sc.	*Keokuk, Iowa.*
Alwin Nicholas Taylor,	Cl.	*Portland, N. Y.*
Charles Edward Temple,	Cl.	*Grand Rapids.*
Frank Taylor Terry,	Cl.	*Milwaukee, Wis.*
Charles Thad. Thompson,	L.	*Detroit.*
Hal Sayre Thompson,	Cl.	*Lima, Ind.*
Annie Louise Tindall,	B. L.	*Flint.*
Charles Watson Tinsman,	Cl.	*Romeo.*
Charles Arnette Towne,	L.	*Spring Lake.*
Rufus Waples, Jr.,	Cl.	*Ann Arbor.*
Edward L. Webster,	Sc.	*Jackson.*
Samuel C. Weiskopf,	Eng.	*Milwaukee, Wis.*
Robert Green West,	L.	*Austin, Texas.*
Jean Augustus Wetmore,	Sc.	*Concord.*
Edwin Ewer White,	Cl.	*Miller's Corners, N. Y.*
Joseph Mandeville White,	Cl.	*Carrollton, Mo.*
Frederick William Whiting,	L.	*Detroit.*
Freeman William Wilcox,	Cl.	*Pinckney.*

NAME.	DEGREE.	RESIDENCE.
George Wiley,	L.	*Detroit.*
Josephine A. Williams,	L.	*Allegan.*
Erma Willson,	Cl.	*Port Huron.*
John Ogden Winner, Jr.,	Cl.	*Pennington, N. J.*
Frank Elmer Wood,	Cl.	*Fort Dodge, Iowa.*
Francis Lodowick York,	Cl.	*Denton.*

STUDENTS WHO ARE NOT CANDIDATES FOR DEGREES.

NAME.	RESIDENCE.
Lida Atkins,	*West Point, Ind.*
Franklin Carrolton Bailey,	*Cazenovia, N. Y.*
Robert Fulton Baker,	*Rome Centre.*
Caroline Farrand Ballentine,	*Port Huron.*
Myra Lena Barnes,	*Owosso.*
Edward Morris Brigham,	*Battle Creek.*
Sidney Burt,	*Howell.*
Alice Elizabeth Clark,	*Ann Arbor.*
Hattie Maria Collier,	*Battle Creek.*
Ellen L. Clothier,	*Fredonia, N. Y.*
William G. Elliot,	*West Unity, Ohio.*
Kate Harwood Ferry,	*Grand Haven.*
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Frank Willis Rowley,	*Grand Rapids.*
William Arthur Sexton,	*Wautoma, Wis.*
Theodore Stein,	*Lincoln, Ill.*
Charles William Teeter,	*Wyoming, Ill.*
Ferdinand Thum,	*Grand Rapids.*
Adrian Hamilton Todd,	*Newport, N. Y.*
Frank Willis Vance,	*Fairview, Pa.*
Frank Charles Wolf,	*Lexington, Ky.*

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GEORGE A. TABOR, M. D.,

STUDENTS.

Name.	Residence.	Preceptor.
Alvin Byron Allyn,	*Ann Arbor,*	G. G. Bigger.
Archibald Herbert Babcock,	*Jamestown, N. Y.,*	C. Ormes & Son.
Fred Herbert Bangs,	*Grand Rapids,*	Dr. Whitfield.
Lynn Keene Blakeslee,	*Detroit,*	Dr. Drake.
Horace Kindall Brasted,	*Howard, N. Y.,*	H. C. Orcutt.
Ellis Charles Brown,	*Cambria, Cal.,*	Dr. McCurdy.
Samuel Albert Brown,	*San Jose, Cal.,*	Faculty.
William Birch Calvert,	*Ann Arbor,*	W. J. Calvert.
George Mills Chase,	*Lowell,*	A. Walker.
Guy Russell Clark,	*Sandy Hill, N. Y.,*	G. W. Little.
Hiram R. Clark,	*Ann Arbor,*	Dr. Stone.
Daniel Peck Cook,	*Kalamazoo,*	Robert King.
John Coolidge,	*Wellsboro, Pa.,*	R. L. Dartt.
Elijah Nash Cooper,	*Jackson,*	S. P. Town.
Calvin Edson Covey,	*Grand Ledge,*	C. J. Covey.
Jabez Percy Dake, Jr.,	*Nashville, Tenn.,*	J. P. & W. C. Dake
William Norton Davis,	*Aylmer, Ont.,*	Clark Brothers.
John H. DeMay,	*Saint Johns,*	A. J. Wiggins.
Frank B. Deubel,	*Ann Arbor,*	Faculty.
John Wesley Dill,	*Ladoga, Ind.*	J. C. Carrier.
Mary Tanner Dill,	*Ladoga, Ind.*	Carrier & Dill.
John Butler Dodge,	*Middle Bass Isl., O.*	Dr. Stroud.
Esther Minerva Durkee,	*Detroit,*	E. R. Ellis.
Ann Elizabeth Eastman,	*Ann Arbor,*	Faculty.
James Henry Enloe,	*Nashville, Tenn.,*	T. E. Enloe.
Peter Erb,	*Buffalo, N. Y.,*	D. Eisbien.
Amanda Jane Evans,	*Ann Arbor,*	S. A. Jones.
Patrick Henry Evans,	*Ann Arbor,*	T. P. Ferguson.
Lottie Elizabeth Fitzgerald,	*Detroit,*	Lucy A. Arnold.
Phebe Ann French,	*Jackson,*	H. B. Ball.
William Alonzo Frost,	*Pontiac,*	C. S. Morley.
Reuben Alpheus Fuller,	*North Irving,*	E. T. Brown.
Leonard Edwin Gallup,	*Marshall,*	B. A. Gallup.

NAME.	RESIDENCE.	PRECEPTOR.
Ernest Egbert Gatchell,	*Ann Arbor,*	Charles Gatchell.
Silas M. Gleason,	*Sheridan,*	H. T. Hubbard.
Oscar Samuel Hartson,	*Ann Arbor,*	J. B. Judson.
R. Selia Henderson,	*Minneapolis, Minn.*	Faculty.
Manchie Eliphalet Howard,	*Marshall,*	Dr. Howard.
Charles Cecil Huff,	*Williamsburg, Pa.,*	E. W. Dean.
Artemus Lincoln Hunt,	*Wayland, N. Y.,*	Faculty.
Thomas Jefferson Jackson,	*Flint,*	Faculty.
Elmer Gardner Keer,	*Hamilton, N. Y.,*	Faculty.
Lavinia D. Lambert,	*San Francisco, Cal.,*	Faculty.
Albert Lodge,	*Detroit,*	E. A. Lodge.
Edward Augustus Lodge,	*Detroit,*	E. A. Lodge.
Daniel A. McLachlan,	*Aylmer, Ont.,*	Clark & Brother.
John Johnston Miller, P. C.,	*Knoxville, Ill.,*	Faculty.
Daniel Webster Mudge,	*Onondaga,*	W. B. Knapp.
C. Harry Myers,	*Ann Arbor,*	Faculty.
Charles Osborne Padley,	*Muskegon,*	T. H. Vestey.
Theodore Oliver Potter,	*Whiteford,*	William Watts.
Elise Jane Ray,	*Findlay, O.,*	A. L. Davis.
Emma Tolbert Schreiner,	*Oil Creek, Pa.,*	Faculty.
Emma Moore Snyder,	*Newark, N. Y.,*	H. P. VanDeusen.
Eugene Clarence Story,	*Greenville,*	T. M. Benedict.
Emeline Tanner,	*Ann Arbor,*	Faculty.
Genevieve Tucker,	*Nashua, Iowa,*	L. M. Tucker.
Frank Harold Tyler,	*Three Rivers,*	W. E. Clark.
Charles Morton Waelder,	*Hannibal, Mo.,*	W. D. Foster.
Aaron Robert Wheeler,	*York,*	C. T. Harris.
Ashley J. Williams,	*Ann Arbor,*	Faculty.
Amos Hiram Winslow,	*Ann Arbor,*	J. G. Lindsley.
James Craven Wood,	*Monroe,*	A. I. Sawyer.

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WILLIAM H. DORRANCE.

STUDENTS.

NAME.	RESIDENCE.	PRECEPTOR.
Fred S. Anderson,	*Pittsfield,*	Faculty.
William Berry Armendt,	*Owensboro, Ky.,*	J. H. Taylor.
Thomas Wesley Beckwith,	*Sycamore, Ill.,*	O. H. Smith.
Uriah Dildine Billmeyer,	*Tecumseh,*	Faculty.
William Fairman Bradner,	*Detroit,*	B. F. Miller.
Levi Tyrus Canfield,	*Chagrin Falls, O.,*	J. E. Phelps.
Sirel Erastus Clark,	*Fredonia, N. Y.,*	G. P. Kingsley.
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William Alexander Chapoton,	*Detroit,*	Faculty.
Henry Coons,	*Detroit,*	W. Walton.
William Henry Dorrance,	*Jackson,*	Practitioner.
James Oscar Dorwart,	*Delaware, O.,*	M. C. Stevens.
Hiram Edgar Dunn,	*Meadville, Pa.,*	Cyrus Lee.
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Alma Füllgraff,	*Elmshorn, Holstein,* (*Prussia.*)	Faculty.
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Fred Bishop Goodspeed,	*Ypsilanti,*	Faculty.
Clark Lowell Gregory,	*Albion,*	Faculty.
Edwin Thorington Grosvenor,	*Troy, Ohio,*	A. J. Grosvenor.
Horace Frederick Harter,	*Akron, O.,*	Lyon & Segur.
Herbert Frank Harvey,	*Cleveland, O.,*	D. R. Jennings.
George Thomas Higgins,	*Brooklyn, N. Y.,*	Faculty.
Frank Hoyer,	*West Shelby, N. Y.,*	S. C. Brownell.
Alfred Wright Hoyt,	*Fond-du-Lac, Wis.,*	A. L. Hoyt.
Mulford Schuyler Hunter,	*Detroit,*	C. H. Laud.
Ormond Courtland Jenkins,	*Ann Arbor,*	W. H. Jackson.
Aaron Churchill Johnson,	*Leslie,*	J. S. Moffitt.
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Otis Freeman Knowles,	*Orion,*	Harris&Knowles.
Thomas Chalmers Leiter,	*Wadsworth,*	Geo. N. Seeley.

NAME.	RESIDENCE.	PRECEPTOR.
William Bennett Libby,	*Fairview, W. Va.,*	J. G. Templeton.
Edwin Jacob Lilly,	*Circleville, O.,*	W. R. Lilly.
Frank Flaviour Little,	*Meadville, Pa.,*	F. G. McCabe.
John Jewett Little,	*Kewanee, Ill.,*	A. E. Matteson.
Ossian C. Moon,	*Richmond, Ind.,*	J. W. Jay.
Guy Hamilton Morgan,	*Bridgewater, Pa.,*	J. G. Templeton.
Arthur Clayton Nichols,	*Ann Arbor,*	W. W. Nichols.
Henry Bristor Orr,	*Mansfield, O.,*	J. B. & T. Bristor.
Douglas Potterf,	*Defiance, O.,*	J. S. Scott.
John Nelson Reynolds,	*Lanesboro, Pa.,*	H. Pennepacker.
Collins McKnight Roe,	*Ontario, O.,*	S. Wagner.
Howard Treat Sackett,	*Tallmadge, Ohio.*	D. E. Fenn.
Lincoln Delano Sells,	*Mansfield, Ohio,*	H. B. Orr.
Samuel Bartlett Short,	*La Grange, Ind.,*	F. M. Hamsher.
E. Frank Sites,	*Fort Wayne, Ind.,*	H. C. Sites.
Frank Muskemmons Spayde,	*Princeton, Ind.,*	F. E. Olney.
Marion Squire,	*Hiram, O.,*	J. C. Canoll.
Immer C. St. John,	*Winona, Minn.,*	W. F. Lewis.
Charles Edwin Stroud,	*Sandusky, O.,*	C. T. Stroud.
Morice James Sullivan,	*San Francisco, Cal.,*	L. L. Dunbar.
Olin Stacy Voak,	*Watkins, N. Y.,*	W. A. Spence.
Frank H. Waldron,	*Brimfield, O.,*	W. J. Caris.
Julius Charles Waldron,	*Brimfield, O.,*	Faculty.
Corydon La Ford Wall,	*Cambridge, O.,*	S. F. Hunter.
Frank B. Wells,	*Ovid,*	C. D. Snover.
William Silvius Whisler,	*Tiffin, O.,*	J. W. Hayford.
Frank Duane Wilson,	*New Lisbon, O.,*	Faculty.
Lawson DeForest Wood,	*Malone, N. Y.,*	Faculty.
Robert Addison Young,	*Romeo,*	J. Douglas.

SUMMARY OF STUDENTS.

DEPARTMENT OF LITERATURE, SCIENCE AND THE ARTS.

Resident Graduates	11	
Fourth Year	49	
Third Year	67	
Second Year	95	
First Year	172	
Select	47	441

DEPARTMENT OF MEDICINE AND SURGERY.

Students.—Total in the Department		329

DEPARTMENT OF LAW.

Seniors	195	
Juniors	211	406

SCHOOL OF PHARMACY.

Second Year	28	
First Year	43	71

HOMŒOPATHIC MEDICAL COLLEGE.

Students.—Total in the College		63

COLLEGE OF DENTAL SURGERY.

Students.—Total in the College		62
Total in the University		1372

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SUMMARY BY STATES,

IN DEPARTMENTS AND IN CLASSES.

STATES AND COUNTRIES	Resident Graduates.	Fourth Year.	Third Year.	Second Year.	First Year.	Select.	Total in the Literary Department.	Medical.	Law.	Pharmacy.	Homœop. Med. Col.	Dental.	Total in the University.
Michigan	9	31	46	70	108	30	294	145	132	33	38	19	661
Ohio	......	1	3	5	10	4	23	20	55	11	2	20	131
New York	......	2	4	2	6	3	17	44	23	4	7	5	100
Illinois	......	3	5	6	13	1	28	14	43	4	1	4	94
Indiana	1	5	1	4	8	3	22	17	34	2	2	4	81
Pennsylvania	......	1	1	......	4	......	6	22	28	3	3	4	66
Wisconsin	......	3	1	3	7	......	14	9	9	1	......	1	34
Ontario (Canada)	......	......	......	......	......	......	......	17	4	1	2	......	24
Iowa	1	1	......	1	3	2	8	5	7	2	1	......	23
Minnesota	......	......	1	1	2	......	4	2	14	......	1	1	22
Missouri	......	......	1	......	1	1	3	4	4	6	1	......	18
Massachusetts	......	1	......	......	4	1	6	8	2	......	......	......	16
Kansas	......	1	......	1	1	......	3	3	10	......	......	......	16
Kentucky	......	......	1	......	......	1	2	......	8	1	......	1	12
California	......	......	......	......	......	......	......	2	4	......	3	1	10
Maine	......	......	......	......	......	......	......	1	5	......	......	......	6
Vermont	......	......	......	......	......	......	......	2	4	......	......	......	6
Colorado	......	......	1	......	2	......	3	......	2	1	......	......	6
Arkansas	......	......	1	......	......	1	2	1	1	......	......	......	4
Texas	......	......	1	1	1	......	3	......	1	......	......	......	4
Oregon	......	......	......	......	......	......	......	1	3	......	......	......	4
New Hampshire	......	......	......	......	......	......	......	2	2	......	......	......	4
Nebraska	......	......	......	......	......	......	......	1	1	1	......	......	3
West Virginia	......	......	......	......	......	......	......	......	2	1	......	......	3
Tennessee	......	......	......	1	......	......	1	......	......	......	2	......	3
New Jersey	......	......	......	......	1	......	1	......	1	......	......	......	2
Connecticut	......	......	......	......	......	......	......	......	1	1	......	......	2
Missisippi	......	......	......	......	......	......	......	......	2	......	......	......	2
South Carolina	......	......	......	......	......	......	......	......	1	......	......	......	1
Virginia	......	......	......	......	......	......	......	1	......	......	......	......	1
District of Columbia	......	......	......	......	......	......	......	1	......	......	......	......	1
Montana	......	......	......	......	......	......	......	......	1	......	......	......	1
Nevada	......	......	......	......	......	......	......	......	1	......	......	......	1
Utah	......	......	......	......	......	......	......	1	......	......	......	......	1
Province of Quebec	......	......	......	......	1	......	1	......	......	......	......	......	1
Nova Scotia	......	......	......	......	......	......	......	1	......	......	......	......	1
Mexico	......	......	......	......	......	......	......	......	1	......	......	......	1
Porto Rico, W. I.	......	......	......	......	......	......	......	2	......	......	......	......	2
England	......	......	......	......	......	......	......	1	......	......	......	......	1
Holstein, Prussia	......	......	......	......	......	......	......	......	......	......	......	1	1
Australia	......	......	......	......	......	......	......	1	......	......	......	......	1
Rangoon, Burmah	......	......	......	......	......	......	......	1	......	......	......	......	1
Total	11	49	67	95	172	47	441	329	406	71	63	62	1372

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CALENDAR

OF THE

UNIVERSITY OF MICHIGAN

FOR

1879-80.

ANN ARBOR:
PUBLISHED BY THE UNIVERSITY.
1880.

ANN ARBOR PRINTING AND PUBLISHING COMPANY.

PREFATORY NOTE.

The general arrangement of the matter in the CALENDAR is the same this year as it was last year. The description of the work of the several Departments is first given, and the names of all the students follow at the end.

The work and the organization of the School of Mines are dropped. The description of the Courses in Civil Engineering and in Advanced Science is found in the chapter devoted to the Department of Literature, Science and the Arts, and the plan of grouping them and other kindred courses in a "Polytechnic School" is given up.

It will be observed that the Faculty of the Department of Literature, Science and the Arts has been enlarged. Consequently several new Courses are offered. In particular much more instruction is offered in Geology, Palæontology and Mineralogy. A new Chair, that of the Science and the Art of Teaching, has been established. Instruction in Sanscrit is now provided. In some of the other branches of learning more Courses are given than before. The number of Courses offered in this Calendar is more than one hundred and sixty.

In the Law School a new Professorship, known as the "Tappan Professorship of Law," has been established. The candidates for admission to the Law School are henceforth to be subjected to a preliminary examination to determine their fitness to enter the School.

In the Medical Schools from this time a three years' course of study is required for graduation. The Department of Medicine and Surgery has been provided by the Regents with a new clinical Amphitheatre. The Homœopathic Medical College is also provided with a Hospital and a clinical Amphitheatre by the avails of an appropriation made by the Legislature at its last session.

The Legislature also appropriated $40,000 for a fire-proof Museum building, which will be completed in the summer of 1880, and $20,000 for a central boiler-house and steam-heating apparatus by which several of the University buildings are now heated.

ANNOUNCEMENTS FOR 1880-81.

1880.		
January	6.	University Exercises resumed after Holiday Vacation.
February	13.	(Evening.) First Semester Closes.
February	16.	Second Semester Begins.
March	23.	(Evening.) Recess of one week begins.
March	24.	The Law School and the Dental College Close. Commencement.
June	26-28.	*Examination of Candidates for Admission to the Department of Literature, Science and the Arts.*
June	27.	*Baccalaureate Address.*
June	29.	Class-Day.
June	30.	*Alumni-Day.*
July	1.	Commencement in the Department of Literature, Science and the Arts, the Department of Medicine and Surgery, the School of Pharmacy, and the Homœopathic Medical College. Summer Vacation begins.
Sept.	16-21.	*Examination of Candidates for Admission to the Department of Literature, Science and the Arts.*
Sept.	22.	First Semester begins.
Sept.	22.	*Examination for admission to the School of Pharmacy.* First year's work begins.
Sept.	27–Oct. 1.	*Examinations for Admission to the Department of Law.*
Sept.	29-30.	*Examinations for Admission to the Department of Medicine and Surgery, the Homœopathic Medical College and the Dental College.*
October	1.	Professional Schools open.
November	—.	Thanksgiving Recess of three days, beginning Tuesday evening.
December	17.	(Evening.) Holiday Vacation begins.
1881.		
January	4.	Exercises resumed.
February	11.	(Evening.) First Semester closes.

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PRESIDENT.

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HON. EDWARD C. WALKER,	*Detroit,*	1882
HON. ANDREW CLIMIE,	*Ann Arbor,*	1882
HON. BYRON M. CUTCHEON,	*Manistee,*	1884
HON. SAMUEL S. WALKER,	*St. Johns,*	1884
HON. GEORGE DUFFIELD, D. D.,	*Lansing,*	1886
HON. GEORGE L. MALTZ,	*Alpena,*	1886
HON. JAMES SHEARER,	*Bay City,*	1888
HON. EBENEZER O. GROSVENOR,	*Jonesville,*	1888

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DANIEL B. BRIGGS, M. A.,	ROMEO.

EXAMINERS.

IN THE DEPARTMENT OF MEDICINE AND SURGERY.

		TERM EXPIRES.
WILLIAM BRODIE, M. D.,	DETROIT,	July, 1880
ARVIN F. WHELAN, M. D.,	HILLSDALE,	July, 1881

EXAMINERS.

IN THE HOMŒOPATHIC MEDICAL COLLEGE.

		TERM EXPIRES.
ALFRED I. SAWYER, M. D.,	MONROE,	July, 1880
ISAAC N. ELDRIDGE, M. D.,	FLINT,	July, 1881

MEMBERS OF THE FACULTIES

AND OTHER OFFICERS.*

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PRESIDENT.

REV. GEORGE P. WILLIAMS, LL. D.,
Emeritus Professor of Physics.

ALONZO B. PALMER, M. A., M. D.,
Professor of Pathology and the Practice of Medicine.

CORYDON L. FORD, M. A., M. D.,
Professor of Anatomy and Physiology.

HENRY S. FRIEZE, LL. D.,
Professor of the Latin Language and Literature.

HON. JAMES V. CAMPBELL, LL. D.,
Marshall Professor of Law.

HON. THOMAS M. COOLEY, LL. D.,
Jay Professor of Law.

EDWARD OLNEY, LL. D.,
Professor of Mathematics.

CHARLES K. ADAMS, LL. D.,
Professor of History.

CHARLES A. KENT, M. A.,
Fletcher Professor of Law.

REV. BENJ. F. COCKER, D. D., LL. D.,
Professor of Moral and Mental Philosophy.

ALBERT B. PRESCOTT, M. D.,
Professor of Organic and Applied Chemistry and Pharmacy.

REV. MARTIN L. D'OOGE, PH. D.,
Professor of the Greek Language and Literature.

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* The names of the Members of the Faculties (except the name of the President), are arranged in the following divisions: Professors, Assistant Professors, Lecturers and Assistants, each name being placed in its appropriate division according to seniority of appointment.

GEORGE S. MORRIS, M. A.,

(Filling the Chair of Modern Languages and Literature in the absence of Prof. Walter.)

CHARLES E. GREENE, M. A., C. E.,

Professor of Civil Engineering.

GEORGE E. FROTHINGHAM, M. D.,

Professor of Materia Medica and Ophthalmic and Aural Surgery.

DONALD MACLEAN, M. A., M. D.,

Professor of Surgery.

EDWARD S. DUNSTER, M. A., M. D.,

Professor of Obstetrics and Diseases of Women and Children.

MOSES COIT TYLER, LL. D.,

Professor of the English Language and Literature.

WILLIAM H. PETTEE, M. A.,

Professor of Mineralogy and Economic Geology.

SAMUEL A. JONES, M. D.,

Professor of Materia Medica, Therapeutics and Experimental Pathogenesy, in the Homœopathic Medical College.

JONATHAN TAFT, D. D. S.,

Professor of the Principles and Practice of Operative Dentistry.

JOHN A. WATLING, D. D. S.,

Professor of Clinical and Mechanical Dentistry.

JOHN W. LANGLEY, S. B., M. D.,

Professor of General Chemistry.

WILLIAM P. WELLS, M. A.,

Kent Professor of Law.

CHARLES I. WALKER, LL. D.,

(Filling the Chair of Kent Professor of Law in the absence of Prof. Wells.)

W. L. B. JENNEY, C. E,*

Professor of Architecture and Design.

EDWARD C. FRANKLIN, M. D.,

Professor of Surgery in the Homœopathic Medical College.

CHARLES GATCHELL, M. D.,

Professor of Theory and Practice of Medicine in the Homœopathic Medical College.

MARK W. HARRINGTON, M. A.,

Professor of Astronomy and Director of the Observatory.

JOSEPH B. STEERE, Ph. D.,

Professor of Zoölogy and Curator of the Museum.

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*Absent on leave.

EDWARD L. WALTER, PH. D.,
Professor of Modern Languages and Literature.

ALEXANDER WINCHELL, LL. D.,
Professor of Historic Geology and Palæontology.

WILLIAM H. PAYNE, M. A.,
Professor of the Science and the Art of Teaching.

HON. ALPHEUS FELCH, LL. D.,
Tappan Professor of Law.

CHARLES K. WEAD, M. A.,
Acting Professor of Physics.

ALBERT H. PATTENGILL, M. A.,
Assistant Professor of Greek.

JOSEPH B. DAVIS, C. E.,
Assistant Professor of Civil Engineering.

WOOSTER W. BEMAN, M. A.,
Assistant Professor of Mathematics.

ISAAC N. DEMMON, M. A.,
Assistant Professor of Rhetoric and Anglo-Saxon.

CHARLES N. JONES, B. A.,
Assistant Professor of Mathematics.

PRESTON B. ROSE, M. D.,
Assistant Professor of Physiological Chemistry and Toxicology, and Lecturer on Renal Diseases.

ELISHA JONES, M. A.,
Assistant Professor of Latin.

REV. RICHARD HUDSON, M. A.,
Assistant Professor of History.

VOLNEY M. SPALDING, M. A.,
Assistant Professor of Botany.

RAYMOND C. DAVIS.
Librarian.

WILLIAM J. HERDMAN, M. D.,
Lecturer on Pathological Anatomy and Demonstrator of Anatomy.

VICTOR C. VAUGHAN, PH. D., M. D.,
Lecturer on Medical Chemistry and Assistant in the Chemical Laboratory.

CHARLES H. STOWELL, M. D.,
Lecturer on Physiology and Histology.

P. R. B. DE PONT, B. A., B. S.,
Instructor in French.

CHARLES S. DENISON, M. S., C. E.,

Instructor in Engineering and Drawing and Assistant in Architecture.

ALFRED HENNEQUIN, M. A.,

Instructor in French and German.

CALVIN THOMAS, M. A.,

Instructor in Modern Languages.

OTIS C. JOHNSON, M. A.,

Assistant in Chemical Laboratory (Qualitative Analysis).

LOUISA REED STOWELL, M. S.,

Assistant in Microscopical Botany.

BYRON W. CHEEVER, M. A., M. D.,

Assistant in Chemical Laboratory (Quantitative Analysis and Assaying.)

WILLIAM H. DORRANCE, D. D. S.,

Assistant in Mechanical Dentistry.

ELIZABETH M. FARRAND,

Assistant Librarian.

DENNIE J. HIGLEY. M. A.,

Assistant in Museum.

ALEXANDER C. MACLEAN, M. D.,

Hospital Surgeon.

DOUGLAS A. JOY, E. M., M. D.,

Assistant in General Chemistry.

JOHN M. SCHAEBERLE, C. E.,

Assistant in the Observatory.

E. FRED WOOD, M. E.,

Dispensing Clerk in the Chemical Laboratory.

FERDINAND THUM,

Assistant in Chemical Laboratory.

JOHN L. IRWIN,

Assistant in Chemical Laboratory.

ASSISTANTS IN THE DEPARTMENT OF MEDICINE AND SURGERY.

GEORGE BYRON AYRES, M. D.,

Assistant to the Professor of Anatomy and Assistant Demonstrator of Anatomy.

GEORGE A. HENDRICKS, M. D.,

Assistant Demonstrator of Anatomy.

E. WIRT LAMOREAUX, M. D.,

Assistant to the Professor of Pathology and Practice of Medicine.

ARTHUR L. WORDEN, M. D.,

Assistant to the Professor of Surgery.

WILLIAM C. STEVENS, M. D.,

Assistant to the Professor of Obstetrics and Diseases of Women and Children.

ASSISTANTS IN THE HOMŒOPATHIC MEDICAL COLLEGE.

PETER ERB, M. D.,

Assistant to the Professor of Theory and Practice.

AARON R. WHEELER, M. D.,

Assistant to the Professor of Surgery.

ASSISTANTS IN THE DENTAL COLLEGE.

URIAH D. BILLMEYER.

ALFRED W. HOYT.

GUY H. MORGAN.

UNIVERSITY OF MICHIGAN.

THE UNIVERSITY AND THE STATE.

The University of Michigan is a part of the public educational system of the State. The constitution of the State provides for the perpetuation of the governing body of the Institution, the Board of Regents. They are elected for terms of eight years by popular vote. In accordance with the law of the State the University aims to complete and crown the work which is begun in the public schools, by furnishing ample facilities for liberal education in Literature, Science and the Arts, and for thorough professional study of Medicine, Law and Dentistry. Through the aid which has been received from the United States and from the State it is enabled to offer its privileges without charge for tuition, to all persons of either sex who are qualified for admission. Its relation to the public schools of the State has now become even closer and more vital than formerly, since under certain conditions the graduates of High Schools are received into the University without examination. While Michigan has endowed her University primarily for the higher education of her own sons and daughters, it must be understood that she also opens the doors of the Institution to all students, wherever their homes. Students from other States are asked to pay a larger admission fee than students from Michigan, but they receive their instruction and have access to all the advantages of life at the University, without incurring any charge for tuition. It is in this broad, generous and hospitable spirit that the University has been founded, and that it endeavors to do its work.

ORGANIZATION OF THE UNIVERSITY.

The University comprises the Department of Literature, Science and the Arts, the Department of Medicine and Surgery, the Department of Law, the School of Pharmacy, the Homœopathic Medical College and the Dental College. Each of these Departments and Colleges has its Faculty of Instruction, who are charged with the special management of it. The University Senate is composed of all the Faculties, and considers questions of common interest and importance to them all.

In the Department of Literature, Science and the Arts, different lines of study lead to the attainment of the degrees of Bachelor of Arts, Bachelor of Science, Bachelor of Philosophy, Bachelor of Letters, Civil Engineer and Mining Engineer.*

Post-graduate courses are provided for the graduates of this University, or for the graduates of any College or University who may desire to pursue advanced study whether for a second degree or not. Students who do not wish to become candidates for a degree may, if they are prepared to enter the University, pursue selected studies for such time, not less than one semester, as they may choose.

The School of Pharmacy is now established as a distinct School, and has a regular course of two years, leading to the degree of Pharmaceutical Chemist.

In the Professional Schools the instruction is given largely by lectures. Degrees are given to graduates as follows: In the Department of Medicine and Surgery, the degree of Doctor of Medicine; in the Department of Law, the degree of Bachelor of Laws; in the Homœopathic Medical College, the degree of Doctor of Medicine; in the Dental College, the degree of Doctor of Dental Surgery.

Students in any Department of the University may enter the classes in any other, upon obtaining permission from the Faculties of the respective Departments.

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*After 1881 the degree of Bachelor of Philosophy will not be conferred, and the degrees of Civil Engineer and Mining Engineer will be conferred only as second degrees. The description of the Higher Degrees will be found in the Chapter devoted to the Department of Literature, Science and the Arts.

THE LIBRARIES.

The Libraries of the University accessible to the students amount, in the aggregate, to about 36,000 volumes.

The General Library contains about 28,000 volumes, and over 8,000 pamphlets. In 1871 it was enlarged by the addition of the library of the late Prof. Rau, the distinguished Professor of Political Economy in the University of Heidelberg, Germany. The Rau Library was purchased and presented to the University by PHILO PARSONS, ESQ., of Detroit. It contains about 4,000 volumes and over 5,000 pamphlets. It is especially rich in European works on the Science of Government, Statistics, Political Economy, and cognate subjects. An annual appropriation of two thousand dollars for the enlargement of the University Library was made by the Legislature at its last session.

The Catalogue consists of two parts, a catalogue of titles on slips, arranged in the alphabetical order of the names of the authors, and a catalogue of the subjects treated in all the books and reviews and magazines in the Library. This catalogue is accessible to readers.

One hundred and twelve American and European periodicals are taken, and sixty magazines and newspapers, representing nearly every part of the country, are kept upon the tables by the Students' Lecture Association.

The Library is open every week day from 9 o'clock A. M. to 5 P. M., and from 7 P. M. to 9½ P. M., and is free to all persons.

The Medical Library, containing about 2,200 volumes, is in the room of the General Library. Thirty Medical Journals are regularly received.

The Law Library, kept in the second story of the Law Building, is open to the students of the Law Department nine hours daily. It contains about 3,500 volumes.

The two Literary Societies in the Department of Literature, Science and the Arts, have also good Libraries.

The Christian Association connected with the University has a well selected Library of moral and religious works. Donations to this Library would be gladly received.

THE ASTRONOMICAL OBSERVATORY.

The Observatory was founded by donations from citizens of Detroit. Valuable additions and improvements have been made by means of funds contributed from the same source, and also by the Regents of the University and the city of Ann Arbor. The building consists of a main part, with a movable dome, and two wings. The east wing contains the large meridian circle presented by Henry N. Walker, Esq., of Detroit. It was constructed by the famous makers, Pistor & Martins, of Berlin, and is one of the largest and best of the kind. The same room contains a sidereal clock, made by Tiede, of Berlin, and the collimators for the meridian circle. The west wing contains the library of the Observatory, and the smaller instruments. One of these is a chronograph with Bond's new isodynamic escapement, for recording observations by the electromagnetic method. This wing connects with the residence of the Director. In the dome is mounted a large refracting telescope, with an object glass thirteen inches in diameter, constructed by the late Henry Fitz, of New York.

Through the liberality of the Legislature means have been provided for the erection of a small Observatory for the purpose of instruction, on the Observatory grounds near the main building. It will contain an equatorial telescope of six inches aperture, and a transit instrument, with zenith telescope attachment, so mounted as to be used either in the meridian or in the prime vertical. In the same enclosure is also a building containing computing rooms and rooms for observers, and a workshop where necessary repairs and attachments for the instruments can be made.

A set of self-registering meteorological instruments has recently been added. It consists of Hough's barograph and thermograph, Robinson's anemometer with Gibbons's self-registering attachment and an anemograph.

THE MUSEUM.

By the liberality of the Legislature means have been furnished for the erection of a fire-proof Museum building. It is now in process of erection. This building is in the Neo-Gothic style, and is one hundred and twenty feet long and forty-seven feet wide and is four stories high. It is expected that it will be ready to receive our collections in the summer or early autumn of 1880.

The collection in the University Museum are illustrative of Natural Science, Ethnology, Art, History, Agriculture, Anatomy and Materia Medica, and are constantly increasing. The whole of the valuable collection which Prof. STEERE made during his five years' explorations in South America, Formosa and the East Indies, has now become the property of the University. The following description will indicate the character of the collections now in the Museum:

I. NATURAL HISTORY.

I. The MINERALOGICAL collection comprises about 6,000 specimens. It embraces about 2,500 specimens (principally European) purchased of the late Baron LEDERER, and known as the LEDERER COLLECTION; and, besides others, a rich collection of the MINERAL SPECIES OF MICHIGAN, including all varieties of copper ore and associated minerals from the different localities of the Lake Superior mining district.

II. The collection in GEOLOGY consists of:

1. The large and complete series of lithological and palæontological specimens brought together by the State Geological Surveys, of which over a hundred fossil species have already become the types of original descriptions.

2. The WHITE COLLECTION, consisting of 1,018 distinct entries, and 6,000 specimens.

3. The ROMINGER COLLECTION, embracing about 2,500 entries and 6,000 specimens, mostly from the Mesozoic formations of Central Europe. This collection embraces about 500 specimens of Mesozoic Ammonites.

4. SMITHSONIAN DEPOSITS, consisting for the present of a collection of foreign and domestic specimens of building stones, and twenty-three specimens of fossils from the Upper Missouri.

5. MISCELLANEOUS DONATIONS AND COLLECTIONS, embracing

more than four cases illustrating the metalliferous regions of the Upper Peninsula, collected by Prof. WINCHELL.

An interesting collection of fossils, chiefly cretaceous, from the Yellow Stone Valley, presented by the late General CUSTER, U. S. A.

The entire Geological Cabinet is estimated to contain about 14,000 distinct entries, and 41,000 specimens.

III. The collections in ZOÖLOGY are very large, and comprise:

1. A complete suit of Birds which visit Michigan, with most of the Mammals of the State; a nearly complete series of the Reptiles found east of the Rocky Mountains; 2,000 species of Mollusca, embracing all the land and fresh-water forms of the Northern and Western States, and a considerable collection of the Fishes and Radiata.

2. The TROWBRIDGE COLLECTION. This is a series of 1,856 entries (3,000 specimens) in most of the classes of the Animal Kingdom, made by Lieut. TROWBRIDGE, (formerly Professor in the University), upon the Pacific coast, with numerous additions from the interior and eastern portions of the Continent, supplied by the Smithsonian Institution.

3. A collection of about 5,000 Coleoptera and Lepidoptera from the estate of the late GEORGE L. AMES, M. D., of Niles.

4. SMITHSONIAN DEPOSITS, consisting of about 200 skins of Birds from the Arctic Zone; 204 entries of Marine Shells from the Indo-Pacific and Panama, labelled by Mr. P. P. CARPENTER; 81 entries of Unionidæ: 250 entries of miscellaneous shells; in all, 535 entries of fresh-water and marine shells.

5. The BEAL-STEERE ZOÖLOGICAL COLLECTION, comprising about 25,000 insects, 1,500 shells, 8,000 birds, and numerous representatives of other groups; total about 10,000 entries and 60,000 specimens.

6. A collection of specimens representing COMPARATIVE ANATOMY. This collection contains several perfect, typical skeletons, and comprises 250 species, and 1,000 specimens.

7. MISCELLANEOUS COLLECTIONS AND DONATIONS. The whole

number of entries in the Zoölogical Cabinet is about 23,250, and the whole number of specimens over 110,000.

IV. The BOTANICAL COLLECTION contains:

1. The plants of the State collected by the public surveys, and numbering about 1,175 species, 1,500 entries, and 9,000 specimens.

2. The HOUGHTON HERBARIUM, collected by the late Prof. DOUGLASS HOUGHTON, M. D., and presented to the University by his widow, the late MRS. R. R. RICHARDS. It consists of 28 folio cases of dried and labelled plants from various parts of the United States, and is estimated to contain 1,800 species.

3. The SAGER HERBARIUM, presented by Prof. ABRAM SAGER, and containing about 1,200 species, and 5,000 specimens, collected mostly in the New England and Western States.

4. The Dr. AMES HERBARIUM, consisting of a serial collection of 7,000 specimens, and 10,500 duplicates, presented by the family of the late Dr. AMES of Niles, Michigan.

5. A collection of Alaskan plants, presented by Capt. W. H. DALL, of the U. S. Coast Survey.

6. A collection of 2,000 species of plants, presented by Prof. M. W. HARRINGTON.

7. A collection of 225 species of mosses from Central Europe, presented by Prof. PAUL REINSCH, Erlangen, Bavaria.

8. A collection of 408 species, over 800 specimens of Algæ, from Mr. HORACE AVERILL.

9. The BEAL-STEERE BOTANICAL COLLECTION, which comprises 500 species, 2,500 specimens, mostly ferns.

10. The ADAMS JEWETT COLLECTION, consisting of 2,500 species, 5,000 specimens. This collection was a part of the estate of the late ADAMS JEWETT, M. D., of Dayton, Ohio, and was presented (1868) by his heirs through H. S. JEWETT, M. D., his son.

11. The LEMMON COLLECTION of 460 species of California plants, presented by J. G. LEMMON.

12. A collection of 300 species from the AGRICULTURAL DEPARTMENT of Washington.

13. A collection of 3,000 German plants from S. S. GARRIGUES, State Salt Inspector, East Saginaw.

14. A collection of truncheons of different varieties of woods from the United States, South America, China and other countries.

15. A collection of the seeds of native and cultivated plants.

The whole Botanical Cabinet contains 10,000 species, 20,000 entries, and 70,000 specimens. The Geological, Zoölogical and Botanical Cabinets, together, are estimated to contain 60,000 entries, and 255,000 specimens.

II. ARCHÆOLOGY AND RELICS.

This Department of the Museum contains various articles of domestic and warlike use among the North American Indians, and the Islanders of the South Pacific; numerous remains of the ancient Peruvians; many specimens of clothing, art, etc., of the Amazonian Indians, modern Peruvians, Chinese, Formosans, and natives of the East Indies and Alaska; and sundry relics and memorials of the enterprises of Peace as well as of our great Civil War. It seems eminently appropriate that the University of Michigan should make efforts to preserve memorials of the native tribes, so fast disappearing before the march of civilization; and it is earnestly hoped that this department of the museum may be deemed a suitable place of deposit for any such relics in the possession of our citizens. A number of interesting relics from the Pacific Islands have been added by the Smithsonian Institution.

Efforts are making to found in the University a collection illustrating the materials, processes, and products of Agriculture and Horticulture. The nucleus of such a collection already exists in—1st, The Botanical and Zoölogical Cabinets, and the Cabinets of Economical Geology; 2d, A collection of the seeds of cereals and other field and garden crops; 3d, An interesting collection of textile fibres and various substitutes for cotton, received from the Department of Agriculture at Washington.

III. THE FINE ARTS AND HISTORY.

This collection was commenced in the year 1855, and at present comprises:

1. A gallery of Casts, in full size and in reduction, of the most valuable ancient Statues and Busts. These were mainly executed at the imperial modelling establishment of the Louvre, by Desachy, of Paris, and by the Brothers Micheli, of Berlin.

2. A gallery of more than two hundred Reductions and Models, in terra cotta and other materials. These represent Statues, Portraits, Busts, Vases, and other antiquities in the Museo Borbonico, and other European Museums. They were executed at Naples.

3. A gallery of Engravings and Photographic Views, executed in Italy and Greece, illustrating especially the architectural and sculptural remains of ancient Rome, Pompeii, Pæstum, Athens and Corinth.

4. The HORACE WHITE COLLECTION OF HISTORICAL MEDALLIONS, comprising—1st, Four hundred and fifty Casts from Antique Gems in the Royal Museum at Berlin, illustrative of Ancient History; 2d, Over five hundred Casts illustrative of Mediæval History and of the Renaissance Period; 3d, About four hundred Medallion Portraits of leading Personages in Modern History.

5. A collection has been commenced of engraved copies of the great masterpieces of modern painting, beginning with those prior to Raphael.

6. The Statute of Nydia, and of Ruth Gleaning, by Randolph Rogers.

7. In addition to the above are several copies of Modern Statues, Busts, and Reliefs, by Michael Angelo, Canova, Thorwaldsen, and others, the most valuable of which are copies in bronze of the Muses, and of the Augustino and Julian di Medici of Michael Angelo.

A Catalogue of this Museum has been prepared with great care by Prof. FRIEZE.

IV. ANATOMY AND MATERIA MEDICA.

The University has become the owner of the valuable Anatomical Museum, formerly the property of Prof. **Ford**, the results of his labor for many years in the preparation and purchase of materials for the direct purpose of most successful teaching.

It embraces a valuable collection of bones, amply illustrating healthy as well as diseased conditions, likewise the various changes from infancy to old age.

It contains numerous skulls, teeth and other preparations of great interest and value, by which not only the structure, but also the various stages in the development of both temporary and permanent teeth are well illustrated; as well as many valuable exhibitions of diseases of the teeth and associated parts, furnishing the Dental student important aid in the prosecution of his studies.

The arterial preparations are numerous, embracing complete and partial dissections, well preserved, exhibiting the normal as well as many abnormal arrangements of vessels, and furnishing ample facilities for studying the vascular system.

There are also models in wax, papier maché, and plaster of various parts of the body which they serve best to illustrate; and the Museum is rich in whatever can best advance the interest of the student.

The valuable collection of Prof. **Sager**, illustrating the comparative craniology, neurology and embryology of the Vertebrata, and also the pathology and anatomy of the diseases of women, has been added to the property of the University, and to it accessions are annually made.

The department of the Museum illustrative of Materia Medica consists of a very complete set of crude Organic Medicinal substances, embracing between five and six hundred specimens, imported from Paris, put up in beautiful glass-covered half-gallon jars, of uniform appearance, finely displayed and arranged according to their order in Natural History; besides about one thousand other specimens of simple Mineral and Vegetable Substances, and Pharmaceutical and Officinal

Preparations, Active Principles, etc., arranged in groups convenient for study.

Besides these actual specimens, Medical Botany is illustrated by between one hundred and two hundred large and finely colored Plates, framed and glazed, and displayed for observation.

All the above collections are arranged in galleries, for the purpose of rendering them accessible both to students and to visitors. The University affords a secure depository for objects of value and curiosity, and it is therefore to be hoped that the Museum will receive accessions by donations from various sources.

EXPENSES.

The only charges made by the University are: To residents of Michigan, an admission fee of ten dollars, and the annual payment of twenty dollars; to those who come from other States or countries, an admission fee of twenty-five dollars, and the annual payment of twenty-five dollars. A by-law of the Board of Regents provides as follows:

Every student before entering any Department of the Unisity, shall pay to the Treasurer the sum of ten dollars, if a resident of Michigan, and the sum of twenty-five dollars if from any other State or country, as a matriculation fee. Each student shall also pay to the Treasurer annually twenty dollars, if a resident of Michigan, and twenty-five dollars, if a resident of any other State or country, to be devoted to the payment of incidental expenses. Resident graduates are required to pay the same annual dues as undergraduates, and no student or graduate shall be allowed to enjoy the privileges of the University, except on presentation to the President of the Treasurer's receipt for all fees and dues specified in this or any other rule or regulation of the Board of Regents.

The name of no person shall be presented by any Faculty to the Board of Regents for a degree, till he has exhibited to the Faculty the receipt of the Treasurer for the payment of all dues, including the fee for diploma.

The admission fee is paid but once, and entitles the student to the privileges of permanent membership in any department of the University. The annual fee is paid the first year, and every year thereafter.

There are no dormitories and no commons connected with the University. Students obtain board and lodging in private families for from three to five dollars per week. Clubs are also formed, in which the cost of board is from one dollar and half to two dollars and a half per week.

It is proper to say, in answer to numerous inquiries, that the University does not undertake to furnish manual labor to students; yet a considerable number of students find in the city opportunities for remunerative labor.

Room rent varies from seventy-five cents to two dollars per week for each student.

The annual expenses of students in the Academic Department for the last few years, *including clothing and incidentals*, have been on the average, about $370. The expenses of Law students and Dental students are from $150 to $200 per term of six months. The expenses of Medical students are greater, since their term continues nine months.

RELATION OF STUDENTS TO THE CITY GOVERNMENT.

Students are temporary residents of the city, and, like all other residents, are amenable to the laws. Whenever guilty of disorder or crime, they are liable to arrest, fine and imprisonment, and can claim no peculiar exemption from public disgrace and legal penalties.

DEPARTMENT

OF

Literature, Science and The Arts.

ADMISSION OF CANDIDATES FOR DEGREES.

All candidates for admission must be at least sixteen years of age, and must present satisfactory evidence of good moral character.

I. CANDIDATES FOR THE DEGREE OF BACHELOR OF ARTS.

Candidates for this degree will be examined in the following studies:

1. English Language.—Each candidate will be required to write an essay of not less than two pages (foolscap), correct in spelling, punctuation, capital letters, grammar, and division into paragraphs, on a subject to be assigned at the time of the examination. The subjects for 1880 will be taken from the following works: Shakespeare's As You Like It, or Macbeth; Scott's Antiquary, or Bride of Lammermoor; Hawthorne's House of the Seven Gables; Dickens's David Copperfield. Every applicant should be familiar with the story of at least four of these works.

In 1881 the subject will be taken from the following: Shakespeare's Twelfth Night, or Othello; Scott's Guy Mannering, or Rob Roy; Dickens's Bleak House; Hughes's Tom Brown at Rugby.

[In 1879 the subjects assigned for the applicants' choice were as follows: The Story of the Caskets, from the Merchant of Venice; The Story of Jeanie Deans, from the Heart of Midlothian; The Cheeryble Brothers, from Nicholas Nickleby.]

In order to secure the preparation above indicated, the following course is recommended to the preparatory schools: 1. A review of the elements of English Grammar during the last years of the preparatory course. 2. Daily recitation for at least one term in some such work as D. J. Hill's "Elements of Rhetoric and Composition," or A. S. Hill's "Principles of Rhetoric." 3. Weekly exercises in original composition for at least two years. A large proportion of those who seek admission to the University are found to be very deficient in their preparation in English.

2. GEOGRAPHY.—General facts of Physical Geography, the Political Geography of Europe and the United States, and Ancient Geography, particularly that of Italy, Greece and Asia Minor.

3. HISTORY.—In Grecian History, the first three books of Smith's History of Greece, exclusive of the chapters on Literature and Art; an outline of Roman History, from the foundation of the City to the Battle of Actium; (after 1880, Leighton's History of Rome, fifty-four chapters, to the accession of Augustus, or an equivalent will be required); an outline of the History of the United States to the close of the Revolutionary War.

4. MATHEMATICS.—*Arithmetic.*—Fundamental Rules, Fractions, Common and Decimal, Denominate Numbers, Percentage, Proportion, Involution and Evolution, and the Metric System of Weights and Measures.

Algebra.—Fundamental Rules, Fractions, Simple Equations, Elimination, Involution and Evolution, the Calculus of Radicals, Quadratic Equations, Ratio, Proportion, and the Progressions, and an Elementary knowledge of Logarithms; *i. e.* through Olney's Complete School Algebra, or an equivalent in other authors.

Geometry.—Plane, Solid and Spherical Geometry, *i. e.*, the first two parts of Olney's Geometry, or an equivalent in other authors.

5. LATIN.—A thorough preparation in all the elements of Latin Grammar. For this purpose the Latin Grammar of Harkness, or of Allen and Greenough is recommended.

Prose Composition.—Jones's Exercises in Latin Prose Composition, or Harkness's Introduction to Latin Composition from page 50 to page 166; or forty-four exercises in Arnold's Latin Prose Composition.

Reading.—Four books of Cæsar's Commentaries; six select Orations of Cicero, and the whole of the Æneid; or the first six books of the Æneid and an amount either of prose or of poetry equivalent to the last six books.

The study of the first six books of the Æneid should be accompanied with that of Prosody.

In reading the last six books the principal aim should be to acquire facility in translation, and increased knowledge of the Latin vocabulary. It is supposed that the student, already familiar with the style of Virgil, will be able to read this portion of the Æneid more easily and rapidly than an equal amount in any other text book.

The *Roman pronunciation of Latin* is recommended.*

Four years, if possible, should be given to the above preparatory course in Latin.

6.—Greek.—*Grammar.*—Hadley's or Goodwin's; *the Etymology must be thoroughly mastered.*

Prose Composition.—Jones's Exercises with special reference to the writing of Greek with the accents, and to the general principles of syntax. Arnold's Exercises are taken as an equivalent.

Reading.—Three books of Xenophon's Anabasis. The so-called continental sound of the vowels and diphthongs, and pronunciation according to the written accent, are preferred. In preparation Boise's First Greek Lessons will be found valuable.

Two full years of daily recitation in Greek are essential to success.

II. CANDIDATES FOR THE DEGREE OF BACHELOR OF LETTERS. (Latin.)

Candidates for this degree will be examined in French or in German, and in all the studies required for the admission of candidates for the degree of Bachelor of Arts, excepting what is above required in Grecian History, in paragraph 3, and what is included in paragraph 6, Greek.

1. French.—A general knowledge of all the principles of French Grammar and of French construction is required, together with some experience in the reading of easy descriptive French. The following works are recommended: Duffet's French Method, or Fasquelle's French Course, or Otto's French Grammar. Hennequin's Treatise on the French Verbs should be used in connection with any of the above works. The amount of reading should be 75 pages. The following

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* Roman Pronunciation of Latin.—The University has adopted the following system of pronunciation, based upon the investigations of Corssen, and other eminent philologists, and now employed in its essential features in the Universities and leading schools of England, and in Harvard, Cornell, and other institutions of this country as being proved beyond question a close approximation to the Roman pronunciation in the time of Cicero.

VOWELS.

Long.	*Short.*
a as in father.	a as in amend, or in quaff, (not as in hat.)
e as in they.	e as in met.
i as in machine.	i as in pity.
o as in go.	o as in police, (not as in cot.)
u as oo in too.	u as in pull, (not as in but.)
y as i.	

works are recommended: Hennequin's French Reading Lessons, or Duffet's French Literature, or Otto's French Reader, or Fasquelle's French Reader.

2. GERMAN.—Those who offer German should be prepared for examination upon the whole of Whitney's German Grammar, excepting the portions printed with the finest type, and excepting also §§ 393–425 and 447-469; also on exercises 1-29 in the supplement to the Grammar ("Exercises for translating from English into German"); and on 75 pages of Whitney's German Reader. If other text-books are used, an equivalent in kind and substance must be offered.

III. CANDIDATES FOR THE DEGREE OF BACHELOR OF SCIENCE.

Candidates for this Degree will be examined in the following studies, *except that those who are to study Civil Engineering will not be examined in Botany or in Latin.*

1. ENGLISH LANGUAGE, GEOGRAPHY AND MATHEMATICS.—In all, same as candidates for B. A.

2. HISTORY.—Swinton's, or Freeman's, or Anderson's Manual of General History, or an equivalent.

3. FRENCH OR GERMAN.—Same requirements as for candidates for B. L. (Latin.)

4. NATURAL PHILOSOPHY.—Norton's Natural Philosophy or an equivalent.

5. BOTANY.—The Elements of Vegetable Anatomy and Physiology, as given in the first 27 chapters of "Gray's Lessons," or the First and Second Parts of Wood's "Class Book of Botany." An analysis and written descriptions of 50 species of Phanerogams.

6. ZOÖLOGY.—The first Part of "Orton's Comparative Zoölogy," or its equivalent.

DIPHTHONGS.

In pronouncing the diphthongs the sound of both vowels is preserved:

ae as the word ay.
au as ow in power.
oe as oi in oil.
eu nearly like u in use.
u in ua, ue, etc., like w.
ei as in rein.

CONSONANTS.

c always as in can.
ch as k.
g always as in gun.
j always as y in young.
s always as in sin.
t always as in tin.
v either as French ou in oui, or like Eng. v.

There is still considerable diversity of opinion among scholars as to the correct sound of v, and though the sound of ou in the French oui, or practically the sound of our w, is given to this consonant here, the sound of English v may be given, if preferred. The other consonants are sounded as in English.

The rules for syllabication are the same as in the old pronunciation, where two consonants come together; but a single consonant between two vowels is to be joined in pronunciation with the latter.

7. English Literature.—Shaw's Manual of English Literature (Backus's edition), or Stopford Brooke's English Literature.

8. Chemistry.—Nichols's Abridgment of Eliot and Storer's Manual, or an equivalent.

9. Latin.—The examination will be on Jones's First Latin Book, or Harkness's Latin Reader, or an equivalent amount in other text books. It is expected that about a year's study will have been given to the subject. This requirement is made with the intention of securing a sufficient knowledge of Latin to enable students to understand and to use readily technical scientific terms in Latin, or derived from Latin. It is recommended to students to make themselves familiar with the Latin nomenclature of Gray's Botany, and also with that of any good text book in Zoölogy.

IV. CANDIDATES FOR THE DEGREE OF BACHELOR OF LETTERS.

Persons who have completed the English course in any one of the approved High Schools of Michigan may hereafter be admitted to the University on diploma. Students who have pursued the English course in other schools may be admitted on examination.

The following list of studies, substantially that of the best High Schools of Michigan, will indicate the scope of the preparation required. Text books are named simply to indicate amounts:

1. Geography.—Same as candidates for B. A.

2. History.—Swinton's Outlines of the World's History; Ridpath's History of the United States to the close of the Revolutionary War; Bright's History of England, Vol. I.; or Green's Shorter History, chapters I.-V., or the whole of Thompson or of Lancaster.

3. Mathematics.—Arithmetic, including the Metric System; Olney's Complete Algebra, Olney's Geometry, Parts I. and II.

4. Science.—Botany and Zoölogy, same as for candidates for B. S.; Norton's Natural Philosophy; Nichols's Abridgement of Eliot and Storer's Manual of Chemistry; Dana's Text-Book of Geology; Physical and Political Geography of Europe and America; Dalton's Physiology; Martin's Civil Government.

5. English Language.-Examination same as for candidates for B.A.

6. English Literature.—Shaw's English Literature (Backus's edition.)

Students will be examined on subjects rather than on specified text-books. Applicants who have not pursued the exact course marked out above will be allowed to present other subjects as equivalents, provided they have the preparation necessary to enter upon the studies required for the degree of Bachelor of Letters, as those studies are taught in the University.

ADMISSION OF STUDENTS WHO ARE NOT CANDIDATES FOR A DEGREE.

Students who are not less than sixteen years of age, and who do not desire to become candidates for a degree, will be admitted to the University, provided they pass the examinations for admission required of the candidates for any degree.

Students who are not less than *twenty-one years of age*, and who do not desire to become candidates for a degree, may be admitted *without the examination* asked in the previous paragraph, provided they give satisfactory evidence to the Faculty that they can profitably pursue the studies they desire to take up.

ADVANCED STANDING.

Candidates for advanced standing will be examined in the studies preparatory to admission to the University, and also in such undergraduate studies as they may ask to be credited with in advance.

THE EXAMINATION FOR ADMISSION.

An examination for admission to the Department of Literature, Science and the Arts, will take place on Saturday and Monday, June 26th and 28th, 1880, and another beginning on Thursday, September 16th, and continuing through the Friday and Saturday and Monday following. These examinations will begin at 9 o'clock A. M. of each day.

The candidate must be provided with credentials from his last instructor, or from the last institution with which he has been connected. These must be presented to the President at his office, before the candidate can enter upon the examination.*

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* Requests for specimen copies of examination papers are often sent to us. As our examinations for admission are chiefly oral, it is not practicable to comply with these requests.

NOTICE TO PREPARATORY SCHOOLS.

A committee of the Faculty will visit once every year any Public High School in Michigan, on request of its School Board, and report its condition to the Faculty.

If the Faculty shall be satisfied from such report that the school is taught by competent instructors, and is furnishing a good preparation to meet the requirements for admission of candidates for any one or more of our degrees, then the graduates from *such preparatory course or courses*, will be admitted to the University without examination, and permitted to enter upon such undergraduate work as the approved preparatory studies contemplated.

They must present to the President within three months after their graduation, the diplomas of their School Board, certifying that they have sustained their examinations in *all* the studies prescribed for admission as candidates for some one of our degrees. They will also be required to appear at once in their places, otherwise they can be admitted only after examination.

The privilege of admission on diploma is limited to public schools in Michigan, and their School Boards must make the application annually.*

COURSES OF INSTRUCTION OFFERED FOR 1879-80.

ELECTION OF STUDIES.

1. The Faculty reserve the right to withdraw the offer of any study not chosen by at least six persons.

2. Each student may elect his studies and may pursue them in any order he may choose, subject only to the following restrictions.

*** At the beginning of the University year 1879-80 students were received on diploma from the following schools: Ann Arbor, Battle Creek, Coldwater, Corunna, Detroit, East Saginaw, Fenton, Flint, Grand Rapids, Michigan Military Academy and Pontiac.**

(a) If he is a candidate for a degree, he must at some time take all the studies which are "required" for the degree he seeks.

(b) Before entering on any study the student must give the Professor in charge satisfactory evidence that he is prepared to pursue it with advantage. It will be seen below that each Professor has specified what studies precede others in his department.

(c) The Faculty will require a student to drop a part of his work at any time, if in their opinion he is undertaking too much, or to take additional work, if they think that he is not sufficiently employed.

(d) No student will be allowed to elect merely a part of a Course without special permission of the Faculty.

(e) No credit will be allowed to a student for work in any Course, unless the election of the work is formally made and reported to the Secretary of the Faculty, before the work is begun.

(f) Students will be asked to avoid a conflict of hours by conforming their choice of studies to the Scheme of Lectures and Recitations which will be issued each semester.

3. After matriculation, a student cannot, without special permission of the Faculty, be admitted to examination in any one of the Courses given, until he has received in the University the regular instruction in such Course.

4. The student is urged to make his choice of studies with care, and with reference to some plan, and to take the advice of judicious friends, if necessary. The members of the Faculty will be ready to render assistance in this regard.

I. THE CLASSICS.

I. GREEK—FIRST SEMESTER.

1. Lysias; Athenian History; Greek Moods and Tenses. Sec. I., *Monday and Thursday*, 10½–11½; *Tuesday and Friday*, 8½–9½; Sec. II., *Mon., Tues., Thurs., Fri.*, 11½–12½. Asst. Prof. PATTENGILL.
2. Thucydides (Sicilian Expedition). *Tues., Wed., Fri.*, Sec. I., 9½–10½; Sec. II., 10½–11½. Asst. Prof. PATTENGILL.

3. Demosthenes (de Corona); Lectures on the Greek Orators. Sec. I., *Mon., Wed., Fri.*, 2–3; Sec. II., *Tues., Thurs., Fri.*, 3–4. Prof. D'OOGE.
4. Plato (Gorgias); Lyric Anthology; Euripides (Medea). *Mon., Wed., Thurs.*, 11½–12½. Prof. D'OOGE.
5. Greek Grammar and Selections from the Anabasis. *Friday*, 11½–12½. Prof. D'OOGE.
11. Herodotus (Bk. VII.). *Tuesday and Thursday*, 2–3. Prof. D'OOGE.

SECOND SEMESTER.

6. Homer (Odyssey). *Mon., Tues., Wed., Thurs.*, Sec. I., 10½–11½: Sec. II., 11½–12½. Asst. Prof. PATTENGILL.
7. Sophocles (Antigone); Æschylus (Prometheus). *Tues, Wed., Thurs., Fri.*, 10½–11½. Prof. D'OOGE.
8. Lucian. (Selections). *Wednesday and Friday*, 8½–9½. Asst. Prof. PATTENGILL.
9. Aristotle (Selections from the Ethics); Aristophanes (Acharnians); Lectures on the Greek Drama. *Mon., Wed., Thurs.*, 11½–12½. Prof. D'OOGE.
10. Greek Prose Composition; Book I. of the Iliad with special reference to the philological peculiarities of the Epic dialect. *Friday*, 11½–12½. Prof. D'OOGE.
12. Sophocles (Electra); Aristophanes (Frogs). *Tues, Wed., Thurs, Fri.*, 9½–10½. Asst. Prof. PATTENGILL.
13. History of Greek Literature and Art. *Tuesday*, 4–5. Prof. D'OOGE.

All students, except those who are admitted to advanced standing, will be required to pursue Course 1 *before passing on to any of the other Courses, which may be taken by the student in the order he prefers.*

Courses 5 *and* 10 *are designed for those who intend to teach.*

Of Courses 7 *and* 12 *only one is required, and the student may choose between them.*

Course 13 *is required of all who have not pursued this study, and who did not take Course* 8 *last year.*

II. LATIN—FIRST SEMESTER.

1. Terence; Latin Grammar; Latin Prose Composition. *Mon., Tues., Wed, Fri.*, Sec. I., 2–3; Sec. II., 3–4; Sec. III., 4–5. Asst. Prof. ELISHA JONES.
2. Quintilian (10th Book); Odes of Horace; Lectures on Roman Literature. *Mon., Tues., Wed., Thurs.*, Sec. I., 10½–11½; Sec. II., 11½–12½. Prof. FRIEZE.
3. Pliny's Letters. *Friday*, 10½–11½. Prof. FRIEZE.

4. Lectures on Classical Antiquities and Art. *Monday and Wednesday*, 3–4. Prof. FRIEZE.
5. Teachers' Course. *Friday*, 4–5. Prof. FRIEZE.
13. Histories of Tacitus. *Time to be arranged with students.* Prof. FRIEZE.

SECOND SEMESTER.

6. Livy; Satires of Horace. *Mon., Tues., Wed., Fri.*, Sec. I., 2–3; Sec. II., 3–4; Sec. III., 4–5. Asst. Prof. ELISHA JONES.
7. Odes and Epodes of Horace. *Tuesday and Thursday*, 10½–11½. Prof. FRIEZE.
8. Horace (Ars Poetica); Juvenal. *Mon., Wed., Fri.*, Sec. I., 9½–10½; Sec. II., 10½–11½. Asst. Prof. ELISHA JONES.
9. Tacitus (Germania and Agricola). *Mon., Wed., Fri.*, 10½–11½. Prof. FRIEZE.
10. Cicero's Tusculan Disputations. *Tuesday and Thursday*, 11½–12½. Prof. FRIEZE.
11. Lectures on Classical Antiquities and Art. *Wednesday*, 3–4. Prof. FRIEZE.
12. Teachers' Course. *Friday*, 4–5. Prof. FRIEZE.
14. Essays of Seneca. Prof. FRIEZE.

Course 1 *and Course* 6 *must precede all the rest. All required courses must precede Course* 13 *and Course* 14.

III. SANSKRIT—FIRST SEMESTER.

1. Elements of Sanskrit and Comparative Grammar; Interpretation of texts contained in Stenzler's Elementar-buch der Sanskrit-Sprache, which is used by the class as a manual. Lectures, *Tuesday and Thursday*, 5–6. Mr. THOMAS.

This course is designed (1) *to familiarize the student with the Sanskrit grammar, and thus prepare him for the reading of Classical Sanskrit;* (2) *to afford an introduction to the study of Comparative Philology.*

SECOND SEMESTER.

2. Continuation of Course 1. Interpretation of the first three books of the Nalopākhyānam, and a portion of the Hitopadeça, or perhaps of Kālidāsa's Çācuntalā, Act I. *Tuesday and Thursday*, 5–6. Mr. THOMAS.
3. In the second semester of 1880–1881, it is proposed to offer a two-hour course—embracing about thirty lectures—upon the Science of Language.

Course 1 *must precede Course* 2. *Students taking Course* 1 *or Course* 3 *must be candidates for the degree of B. A., or M. A., and must have pursued the study of Latin and Greek in the University at least three semesters, and the study of German at least one year.*

II. MATHEMATICS.

FIRST SEMESTER.

1. Advanced Algebra. *Mon., Tues., Wed., Thurs.,* Sec. I., 8½–9½; Sec. II., 9½–10½; Sec. III., 10½–11½; Sec. IV., 11½–12½; Sec. V., 5–6. Asst. Prof. C. N. Jones and Asst. Prof. Beman.
2. General Geometry and Calculus. *Mon., Tues., Wed., Thurs.,* Sec. I., 3–4; Sec. II., 4–5. Prof. Olney and Asst. Prof. Beman.
3. Advanced General Geometry and Calculus. *Five times a week,* 2–3. Prof. Olney.
4. Determinants. *Friday,* 8½–9½. Asst. Prof. C. N. Jones.
10. Trigonometry. *Tuesday and Thursday,* 2–3. Asst. Prof. Beman.

SECOND SEMESTER.

5. Advanced Geometry; Plane and Spherical Trigonometry. *Mon., Tues., Wed., Thurs.,* Sec. I., 9½–10½; Sec. II., 3–4; Sec. III., 4–5; Sec. IV. and Sec. V., 5–6. Asst. Prof. C. N. Jones and Asst. Prof. Beman.
6. General Geometry and Calculus. *Mon., Tues., Wed., Thurs.,* Sec. I., 3–4; Sec. II., 4–5. Prof. Olney and Asst. Prof. Beman.
7. Modern Geometry and Trilinear Co-ordinates. *Tuesday and Thursday,* 2–3. Asst. Prof. Beman.
8. Calculus of Variations. *First half of semester. Monday and Wednesday,* 2–3. Prof. Olney.
9. Quaternions. *Second half of semester. Monday and Wednesday,* 2–3. Prof. Olney.
11. Analytical Mechanics. *Tues., Wed., Thurs., Fri.,* 8½–9½. Asst. Prof. C. N. Jones.

Courses 1 *and* 5 *must precede all the rest. Courses* 4 *and* 7 *cannot be taken until Courses* 1, 5, 2 6 *are completed; and Courses* 8, 9 *must be preceded by* 1, 5, 2, 6, 3. *Course* 11 *cannot be taken till after Course* 3.

It is proposed to add a two years' course of Mathematical reading as soon as there shall be a sufficient demand for it, in such standard works as Salmon's Higher Algebra, Frost's Solid Geometry, Dostor's Determinants, Todhunter's or Price's Integral Calculus, and Taite's Quaternions.

III. MODERN LANGUAGES AND LITERATURE.

I. FRENCH—FIRST SEMESTER.

1. Beginning French — Duffet's French Grammar; Hennequin's French Reading Lessons. *Mon., Wed., Thurs., Fri.,* Sec. I., 8½–9½; Sec. II., 2–3. Mr. de Pont. Sec. III., 11½–12½. Mr. Hennequin.
2. Idiomatic Analysis. Composition and Conversation. *Mon., Wed., Thurs., Fri.,* Sec. I., 10½–11½; Sec. II., 11½–12½. Mr. de Pont. Sec. III., 10½–11½. Mr. Hennequin.

3. French Classics. *Mon., Wed., Fri.*, 11½–12½. Prof. Morris.
4. Romantic Dramas. *Tuesday and Thursday*, 11½–12½. Prof. Morris.

SECOND SEMESTER.

5. Duffet's French Grammar; French Plays and Modern Prose-writers. *Mon., Wed., Thurs., Fri.*, Sec. I., 8½–9½; Sec. II., 11½–12½. Mr. de Pont. Sec. III., 11½–12½. Mr. Hennequin.
6. Composition and Conversation; Romantic Plays and Modern Prose; Géruzez, Littérature Française. *Mon., Wed., Thurs., Fri.*, Sec. I., 10½–11½. Mr. de Pont. Sec. II., 10½–11½. Mr. Hennequin.
7. Section I. Brachet's Morceaux choisis des grands écrivains français du XVI. Siécle. (Philological.) *Mon., Wed., Fri.*, 11½–12½. Prof. Walter. Section II. Master-pieces of the XIX Century. (Literary and Conversational.) *Mon., Wed., Fri.*, 8½–9½. Mr. Hennequin.

Courses 1 *and* 5 *must precede all others. Courses* 2 *and* 6 *must precede Course* 3. *Course* 3 *must precede Course* 4. *Course* 7 *is open to candidates for the degree of B. A. who have had Courses* 1 *and* 5, *and to all others, who have had Courses* 1, 5 *and* 2.

II. GERMAN—FIRST SEMESTER.

1. Beginning German; Whitney's Text Books. *Tues., Wed., Thurs., Fri.*, Sec. I., 8½–9½; Sec. II., 9½–10½. Mr. Hennequin. Sec. III., 3–4; Sec. IV., 4–5. Mr. Thomas.
2. Goethe's Iphigenia; German Lyrics. *Five times a week.* Sec. I., 8½–9½. Mr. Thomas. Sec. II., 10½–11½. Prof. Morris.

SECOND SEMESTER.

3. German Plays. *Tues., Wed., Thurs., Fri.*, Sec. I., 9½–10½. Mr. Hennequin. Sec. II., 10½–11½. Mr. Thomas. Sec. III., 11½–12½. Mr. Thomas.
4. Lessing's Laokoon. *Wednesday and Friday*, 10½–11½. Prof. Walter.
5. Kluge; Geschichte der deutschen Literatur, *Tuesday and Thursday*, 10½–11½. Prof. Walter.
6. Goethe's Faust. *Mon., Wed., Fri.*, 8½–9½. Mr. Thomas.
7. Gothic; Ulfilas (Heyne's Edition). *Tuesday and Thursday*, 8½–9½. Prof. Walter.

The last four Courses are open to those who have completed Courses 1 *and* 3.

IV. ENGLISH LANGUAGE AND LITERATURE.

FIRST SEMESTER.

1. English Grammar and Speeches. Sec. I., *Monday and Wednesday*, 2–3; Sec. II., *Monday and Wednesday*, 3–4; Sec. III., *Tuesday and Thursday*, 2–3. Asst. Prof. Demmon. Text Books: Abbot's "How to Parse" and "How to Write Clearly." Each member of the Class will present two speeches.

2. Rhetoric; Theory and Practice. *Tuesday and Thursday*, 3–4. Asst. Prof. Demmon. Text Book: D. J. Hill's "Science of Rhetoric." Each student will present two Essays.

This Course is intended for students that have completed at least the first year's work in the University. It must be preceded by Course 1 *or Course* 7, *and after this year by Course* 1 *in Psychology.*

4. English Literature; Anglo-Saxon Period. *Monday and Wednesday*, 4–5. Asst. Prof. Demmon. Text Books: Sweet's "Anglo-Saxon Reader," and Morley and Tyler's "Manual of English Literature," Part I.

5. English Literature; Early Modern English Period. *Thursday and Friday*, 2–3. Prof. Tyler. Text Books: "Works of Chaucer," Aldine edition, and "Manual of English Literature," Part III.

This Course must be preceded by Course 1 *or Course* 7.

6. English Literature; Study of Masterpieces. *Twice a week*, (*once, two hours; once, one hour.*) Sec. I., *Monday*, 2–4; Sec. II., *Tuesday*, 2–4; Sec. III., *Wednesday*, 2–4; Secs. I., II. and III., *Thursday*, 3–4. Prof. Tyler. The Masterpieces: (*a*) More's Utopia (Arber's Reprint); (*b*) Bacon's Essays; (*c*) Milton's Areopagitica (Arber's Reprint); (*d*) Burke's Reflections on the French Revolution; (*e*) DeQuincey's Opium Eater; (*f*) Carlyle's Sartor Resartus; (*g*) Spenser's Faery Queen, Book I.; (*h*) Shakespeare's Sonnets; (*i*) Milton's Paradise Lost; (*j*) Dryden's Absalom and Achitophel; (*k*) Pope's Rape of the Lock; (*l*) Wordsworth's Excursion; (*m*) Tennyson's Princess.

This Course must be preceded by Courses 5 *and* 10, *and it is strongly recommended that these Courses be preceded by Courses* 4 *and* 9.

12. English Literature; Study of its Principal Forms in Prose and Verse. *Friday*, 3–4. Prof. Tyler. Lectures.

This Course must be preceded by Course 5 *and Course* 10. *It will be given in* 1880–1, *and not in the year following.*

13. The History and Principles of Journalism. *Friday*, 3–4. Prof. Tyler. Lectures.

This Course will be given in 1881–2, *and not in the year following.*

SECOND SEMESTER.

7. English Grammar and Speeches. *Monday and Wednesday*, 3–4. Asst. Prof. Demmon.

This Course is the same as Course 1.

8. Rhetoric; Theory and Practice. *Tuesday and Thursday*, 3–4. Asst. Prof. Demmon.

This Course is the same as Course 2.

9. English Literature; Transitional English Period. *Monday and Wednesday*, 4-5. Asst. Prof. DEMMON. Text Books: Corson's "Handbook of Anglo-Saxon and Early English," and "Manual of English Literature," Part II.

10. English Literature; Modern English Period. *Thursday and Friday*, 2-3. Prof. TYLER. Text Book: "Manual of English Literature," Part IV.

This Course must be preceded by Course 5.

11. English Literature; Study of Shakespeare. *Twice a week, (once, two hours; once, one hour)*. Sec. I., *Monday*, 2-4; Sec. II., *Tuesday*, 2-4, and Sec. III., *Wednesday*, 2-4; Secs. I., II and III., *Thursday*, 3-4. Prof. TYLER. Plays selected: Richard II., The two Parts of Henry IV., Richard III., Twelfth Night, As You Like It, The Merchant of Venice, A Midsummer Night's Dream, Lear, Hamlet, Othello, and Macbeth.

This Course must be preceded by Course 6.

14. The History of the English Drama. *Friday*, 3-4. Prof. TYLER. Lectures.

This Course must be preceded by Course 5 *and Course* 10. *It will be given in* 1880, *and not in the year following.*

15. American Literature. *Friday*, 2-3. Prof. TYLER. Lectures.

This Course will be given in 1881, *and not in the year following.*

V. HISTORY.

FIRST SEMESTER.

1. General History of England from the Accession of the House of Tudor to the Overthrow of the Stuarts; Recitations from Bright, vol. II. *Tues., Thurs., Fri.*, 4-5. Asst. Prof. HUDSON. Sec. I., 9½-10½; Sec. II., 4-5.

2. History of Civilization in the Middle Ages; Lectures twice a week, and Recitations from Guizot once a week. *Mon., Wed., Fri.*, 3-4. Prof. ADAMS.

In 1880-81, *this Course will probably be given in the Second Semester.*

3. Political History of England since the Overthrow of Napoleon I.; Lectures. *Tuesday and Thursday*, 4-5. Prof. ADAMS.

4. Historical Seminary. The Constitutional History of England. The class is divided into sections, each section meeting once a week for two hours. *Tuesday*, 10½-12½; *Monday and Wednesday*, 4-6. Prof. ADAMS.

6. The Political History of America from the Settlement at Jamestown to the adoption of the Articles of Confederation; Recitations and Essays. *Monday and Wednesday*, Sec. I., 9½-10½; Sec. II., 5-6. Asst. Prof. HUDSON.

8. The Political Development of Prussia from its Earliest History down to the present time; Lectures. *Tuesday and Thursday*, 4–5. Prof. ADAMS.

This Course is not given in 1879–80, *but will probably be given in* 1880–81.

14. Constitutional History of the United States. Advanced Class in Von Holst, vol. II. *Tuesday and Thursday*, 5–6. Asst. Prof. HUDSON.

SECOND SEMESTER.

7. General History of Continental Europe from the Revival of Learning to the French Revolution; Recitations and Essays. *Tues., Thurs., Fri.*, 8½–9½. Asst. Prof. HUDSON.

In 1880–81, *this Course will probably be given in the First Semester.*

9. General History of England from the Overthrow of the Stuarts to the close of the Napoleonic Wars; Recitations from Bright, vol. III. *Mon., Wed., Fri.*, Sec. I., 4–5; Sec. II., 5–6. Asst. Prof. HUDSON.

10. Constitutional History of the United States. Advanced Class in Von Holst, vol. I. *Tuesday and Wednesday*, 5–6. Asst. Prof. HUDSON.

11. The Government of England, its Theories and its Methods at Home and Abroad; Lectures. *Tuesday and Thursday*, 4–5. Prof. ADAMS.

This Course will not be given in 1880–81.

12. Historical Seminary. Political History of the United States. *Three hours a week, (once two hours; once one hour.)* Sec. II., *Tuesday*, 10½–12½; Sec. I., *Monday*, 4–6; Sec. III., *Wednesday*, 4–6. Prof. ADAMS.

Courses 1 *and* 9 *must precede Course* 4. *After* 1880–81 *Course* 4 *can be taken only by postgraduates, and those who have previously had Courses* 1, 2, 7 *and* 9. *Courses* 6 *and* 10 *must precede Course* 12. *After* 1880–81, *Course* 12 *can be taken only by postgraduates, and those who have previously had Courses* 2, 6, 7 *and* 10.

VI. PHILOSOPHY.

FIRST SEMESTER.

1. Psychology. *Tuesday and Thursday*, 10½–11½. Dr. COCKER.
2. Speculative Philosophy and Ethics. *Five times a week*, 9½–10½. Dr. COCKER.

Speculative Philosophy (Ontology) will embrace Rational Cosmology, Rational Psychology and Rational Theology. Ethics will embrace the Postulates of Ethics, the Fundamental Concepts of Ethics, and the Ethical views of the World and Life.

SECOND SEMESTER.

3. Logic. (1) The Science of the Laws of Thought. (2) The Science of Knowledge in General. *Tuesday and Thursday*, 10½–11½. Dr. COCKER.
4. History of Philosophy. *Five times a week*, 9½–10½. Dr. COCKER.

It is recommended that Courses 1 *and* 3 *be not taken until the student has resided some time at the University, and either Course* 1 *or Course* 3 *must be taken before the student can be admitted to Courses* 2 *and* 4.

VII. THE SCIENCE AND THE ART OF TEACHING.

FIRST SEMESTER.

1. Practical. Embracing school supervision, grading, courses of study, examinations, the art of instructing and governing, school architecture, school hygiene, school law, etc. Lectures. *Tuesday and Thursday*, 2–3. Prof. PAYNE.

Those taking this Course may be asked to hold two additional meetings a week for conference and discussion.

SECOND SEMESTER.

2. Historical, Philosophical and Critical. Embracing history of education, the comparison and criticism of the systems in different countries, the outlines of educational science, the science of teaching, and a critical discussion of theories and methods. Lectures. *Tuesday and Thursday*, 5–6. Prof. PAYNE.

Either Course 1 *or Course* 2 *will be requisite for obtaining a Teacher's Diploma.*

VIII. POLITICAL ECONOMY.

FIRST SEMESTER.

1. Elementary Course. Sec. I., *Monday and Wednesday*, 2–3; Sec. II., *Tuesday and Thursday*, 2–3.
2. Advanced Political Economy. *Tuesday and Thursday*, 3–4.

IX. INTERNATIONAL LAW.

SECOND SEMESTER.

1. Lectures on International Law. *Tuesday and Thursday*, 2–3.

X. PHYSICAL SCIENCES.

I. PHYSICS—FIRST SEMESTER.

1. Experimental Physics. *Two Lectures and one Recitation a week.* Prof. WEAD. Lectures, *Tuesday and Thursday*, 9½–10½; Recitations, *Wednesday*, Sec. I., 10½–11½; Sec. II., 2–3.
2. Experimental Lectures with Recitations from Text Book. *Five times a week.* Prof. WEAD. Lectures, *Tuesday and Thursday*, 11½–12½; Recitations, *Mon., Wed., Fri.*, Sec. I., 9½–10½; Sec. II., 11½–12½.

7. Theoretical Physics. *Monday and Friday,* 10½-11½.
8. Physical Problems. *Monday,* 2-3.

SECOND SEMESTER.

3. Physical Laboratory Work (Full Course). *Five times a week.* Prof. Wead. *Daily, two hours between* 2 *and* 5.
4. Physical Laboratory Work. *Three times a week.* Prof. Wead. *Friday,* 2-3, *and any other two days for two hours between* 2 *and* 5.
5. Higher Acoustics, including the Physical Basis of Music. Prof. Wead. *Thursday,* 4-5.
6. Teachers' Course. *Eight or ten lectures at an hour to be agreed on hereafter. No credit is given and no examination required.*

For admission to Course 1 *or Course* 2, *the Mathematics now required for entrance and Plane Trigonometry will be required; it is recommended that one full year's study of Mathematics be taken in the University before beginning Physics.*

For admission to Course 3 *or to Course* 4, *Course* 2 *of Physics and either Course* 1 *or Course* 2 *of Chemistry will be required, and a knowledge of the Elements of the Differential Calculus will be presupposed, though not absolutely required. In Courses* 3 *and* 4 *provision is made for advanced students as well as for beginners.*

For admission to Courses 5 *and* 6, *Course* 1 *or Course* 2 *is required.*

Instead of the Course in Advanced Acoustics, a similar Course in Optics will probably be given in 1881.

For admission to Course 7, *Course* 1 *or* 2 *in Physics, Course* 1 *or* 2 *in General Chemistry, and Course* 2 *in Mathematics are required.*

Course 8 *is intended to be taken in connection with Course* 1 *or Course* 2.

Where Course 1 *is required for graduation or for entrance to other classes, Course* 2 *may be substituted by the student.*

II. GENERAL CHEMISTRY—FIRST SEMESTER.

4. Laboratory Methods of Studying General Chemistry. *Three times a week, on any three out of five afternoons, two hours each exercise.*
5. The same subject as the above. *Five times a week.*

SECOND SEMESTER.

1. Experimental and General Lectures. *Mon., Wed., Fri.,* 11½-12½.
2. Lectures as above and in addition recitations on two days. *Total, five times a week,* 11½-12½.
3. Lectures and recitations on the Kinetic Theory of Gases and on Chemical Philosophy. *Tuesday and Thursday,* 9½-10½.

III. ANALYTICAL CHEMISTRY—FIRST SEMESTER.

1. Qualitative Analysis. *Five times a week in recitation and five times a week in Laboratory, to count as two Full Courses. Recitation at* 2. Mr. Johnson.

SECOND SEMESTER.

4. Organic Chemistry. Lectures. *Three to five times a week;* and, after the March recess, Proximate Organic Analysis, *one hour in the Laboratory, five times a week;* making one Full Course. Prof. PRESCOTT.

EITHER FIRST OR SECOND SEMESTER.

5. Quantitative Analysis. *Twice a week in the class-room, and five times a week in the Laboratory, to count as one and two-fifths Full Courses. In the First Semester, it may be completed before the Holidays as one Full Course; and it may be continued from the First Semester to the March recess, as two Full Courses.* Mr. CHEEVER.
7. Ultimate Organic Analysis. *Five times a week in the Laboratory.* Prof. PRESCOTT.
8. Physiological Chemistry. *Five times a week, including Laboratory work and lectures.* Asst. Prof. ROSE.
9. Assaying Ores, wet and dry. *Laboratory work and lectures, every day for two months, equivalent to a three-fifths Course.* Mr. CHEEVER.
10. Blow-pipe Analysis. *Every day, for six weeks, equivalent to a two-fifths Course, including Laboratory work and lectures.* Mr. CHEEVER.
11. Original Investigations. *Five times a week, Laboratory work and reading.* Prof. PRESCOTT.
12. Assaying of Ores, dry way. *Laboratory work and lectures, every day, for six weeks, equivalent to a two-fifths Conrse.*

The Laboratory work requires from two to three hours daily, taken between 1 *and* 5; *after the March recess, between* 1 *and* 6.

The hours of class-work, except in Course 1, *must be arranged with the respective instructors.*

Course 1 *or Course* 2 *in General Chemistry must precede any course in Analytical Chemistry. Courses* 8 *and* 10 *are open to those who have completed Course* 1; *and Courses* 7, 9 *and* 11 *to those who have taken Courses* 1 *and* 5.

IV. ASTRONOMY—FIRST SEMESTER.

1. Theoretical Astronomy. *Five times a week,* 4–5. Prof. HARRINGTON.
5. General Meteorology. *Tuesday and Friday,* 5–6. Prof. HARRINGTON.

SECOND SEMESTER.

2. General Astronomy. *Mon., Wed., Fri.,* 4–5. Prof. HARRINGTON.
3. Spherical and Practical Astronomy. *Tuesday and Thursday,* 4–5. *Designed especially for Engineers.* Prof. HARRINGTON.
4. Theoretical Astronomy. *Five times a week,* 5–6. Prof. HARRINGTON.

Courses 1 *and* 4 *must be preceded by Course* 2, *and by Courses* 1, 2, 3, 5, *and* 6 *in Mathematics. Course* 2 *must be preceded by Course* 1 *in Physics. Those who take it are required to have completed some elementary work in*

Astronomy, as Lockyer's, Loomis's or White's. Course 3 *must be preceded by Courses* 1, 2, 3, 5, *and* 6 *in Mathematics. Course* 5 *must be preceded by Course* 1 *or* 2 *in Chemistry.*

XI. MINERALOGY AND GEOLOGY.

I. MINERALOGY—SECOND SEMESTER.

1. Short Course in Mineralogy. *Wednesday and Friday,* 4-6. Prof. PETTEE.
2. Mineralogy and Lithology. *Five times a week,* 8½–10½. Prof. PETTEE.

II. GEOLOGY—FIRST SEMESTER.

1. Succession of Geological Events, embracing in their relations, the elements of geological dynamics, continent-building, and sculpturing, rock-classification, geographical geology, time-divisions, and Palæontology. Part I, Facts and Doctrines. *Monday and Wednesday,* 11½–12½. Prof. WINCHELL.
2. Oral Exercises. Supplementary to Course 1, and parallel with it; being a review, with exercises on the geological map, and in various specific geological problems. *Friday,* 11½–12½. Prof. WINCHELL.
3. Palæontology. Exercises consisting of lectures, reading and museum study. *Tuesday and Thursday,* 11½–12½. Prof. WINCHELL.
4. Palæontological Investigations. Consist of laboratory work, with reading, and such instruction as the student may require. *Two hours, five times a week,* 2–4. Prof. WINCHELL.

SECOND SEMESTER.

5. General Geology, Part II. Theories. *Monday and Wednesday,* 3–4. Prof. WINCHELL.
6. Oral Exercises Parallel with Course 5. *Friday,* 3–4.
7. Palæontological Investigations as in Course 4.
8. Economic Geology. *Tuesday and Thursday,* 4–6. Prof. PETTEE.
9. Geology of the United States. *Monday,* 4–6. Prof. PETTEE.

Courses 2 *and* 6 *are intended to accompany Courses* 1 *and* 5 *respectively. Either may be taken, however, by any person somewhat acquainted with the elements of Geology.*

Course 3 *must be accompanied by Course* 1, *if the student has not previously pursued Historical Geology; it must also follow Course* 2 *in Zoölogy. Course* 5 *can be taken only by those who have had Course* 1, *or an equivalent.*

Courses 4 *and* 7 *are intended for students aspiring to geological proficiency. They must follow Course* 1, *and also Courses* 1 *to* 5 *in Zoölogy.*

XII. BIOLOGICAL SCIENCES.

I. ZOÖLOGY—FIRST SEMESTER.

1. Systematic Zoölogy; Lectures. *Five times a week*, 8½–9½. Prof. Steere.
2. Invertebrates, with Identification of Species; Lectures and Laboratory work. *Five times a week*, 9½–10½. Prof. Steere.

SECOND SEMESTER.

3. Comparative Anatomy and Physiology; Lectures. *Five times a week*, 8½–9½. Prof. Steere.
4. Identification of Vertebrates and special study of the same; Lectures and Laboratory work. *Five times a week*, 9½–10½. Prof. Steere.
5. Entomology. *Tuesday*, 4–5, *and five times a week in Zoölogical Laboratory, time to be arranged with students.* Mr. Higley.

Course 1 *or Course* 3 *must precede Courses* 2 *and* 4. *Course* 5 *must be preceded by Course* 1 *or* 3.

II. BOTANY—FIRST SEMESTER.

1. Cryptogamic Botany. *Five times a week, including Laboratory work*, 2–5, *and Lectures. Tuesday and Thursday*, 8½–9½. Asst. Prof. Spalding.
2. Pharmaceutical Botany. (*a*) Pharmacology. *Twice a week.* Asst. Prof. Spalding. (*b*) Structural Botany and Laboratory work. *Three times a week.* The Laboratory being open every day, the student may choose his days. Mrs. Stowell.

SECOND SEMESTER.

3. Structural Botany. (*a*) Microscopy and Laboratory work. *Three times a week*, 9½–12½. Mrs. Stowell. (*b*) Lectures. *Twice a week. Tuesday and Thursday*, 8½–9½. Asst. Prof. Spalding.
4. Special investigations of Plant Structure accompanied by Physiological Experiments. *Three times a week.* Lecture. *Monday*, 8½–9½. *Laboratory work two hours in afternoon, two days.* Asst. Prof. Spalding.

All of the above Courses, except Course 5, *require practical work in the Microscopical Laboratory. Two hours of laboratory work are equivalent to one hour of class-room work. Course* 3 *must precede Courses* 1 *and* 4.

XIII. CIVIL ENGINEERING.

I. DRAWING—FIRST SEMESTER.

1. Geometrical Drawing. *Tuesday and Thursday*, 2–4. Asst. Prof. Davis.
2. Topographical Drawing, Lettering and Ornamentation. *Tuesday and Thursday*, 8½–10½. Mr. Denison.
3. Mechanical Drawing. *Mon., Wed., Fri.*, 2–4. Asst. Prof. Davis.

4. Free-hand Drawing; Pen and Ink Drawing. *Mon., Wed., Fri.,* 8½–11½. Mr. DENISON.

SECOND SEMESTER.

5. Descriptive Geometry. *Mon., Wed., Fri.,* 8½–10½. Asst. Prof. DAVIS.
6. Shades, Shadows and Perspective. *Monday and Friday,* 8½–11½. Mr. DENISON.
7. Free-hand Drawing (Advanced.) *Mon.. Wed., Fri.,* 8½–11½. Mr. DENISON.
8. Architectural Water-color Drawing. *Tuesday and Thursday,* 8½–10½. Mr. DENISON.

Course 1 *precedes Course* 4, *and Course* 4 *must precede Course* 5.

II. SURVEYING—FIRST SEMESTER.

1. Surveying; Use of Transit and Level. *Mon., Wed., Fri.,* 8½–12½. Asst. Prof. DAVIS.
2. Surveying with Compass; Solar Compass; U.S. Surveys. *Tuesday and Thursday,* 8½–12½. Asst. Prof. DAVIS.

SECOND SEMESTER.

3. Higher Surveying; Plane Table; Sextant; Earth-work. *Five times a week,* 2–6. Asst. Prof. DAVIS.
4. Field Work. *Four weeks entire,* 8–12 and 1–5. Asst. Prof. DAVIS.

Courses 1 *and* 2 *presuppose a knowledge of Plane Trigonometry. Course* 3 *must be preceded by Courses* 1 *and* 2.

III. CIVIL ENGINEERING—FIRST SEMESTER.

1. Strength and Resistance of Materials. *Monday and Wednesday,* 9½–10½. Prof. GREENE.
2. Engineering; Theory of Construction. *Tuesday and Thursday,* 9½–10½. Prof. GREENE.
3. Graphical Analysis of Structures. *Friday,* 9½–10½. Prof. GREENE.
4. Engineering Design. *Five times a week,* 2–4. Prof. GREENE.
5. Mechanism and Machine Drawing. *Tuesday and Thursday,* 8½–10½. Mr. DENISON.
6. Machinery and Prime Movers; Water Wheels and Steam Engines. *Mon., Wed., Fri.,* 10½–11½. Prof. GREENE.

SECOND SEMESTER.

7. Applied Mechanics. *Monday,* 10½–11½. Prof. GREENE.
8. Engineering; Theory of Construction. *Mon., Tues., Thurs., Fri.,* 9½–10½. Prof. GREENE.
9. Hydraulics; Water Supply and Sewerage. *Wednesday,* 9½–10½. Prof. GREENE.
10. Stereotomy. *Tuesday and Thursday,* 8½–10½. Mr. DENISON.

Courses 5 *and* 10 *must be preceded by Course* 4 *in Drawing. A knowledge of the Integral Calculus is requisite to pursue Course* 7, *and this Course* (7) *must precede Courses* 1, 2, 6, 8 *and* 9. *Course* 4 *accompanies Courses* 1, 2 *and* 8.

XIV. BIBLIOGRAPHY.

Mr. Davis, the Librarian, gives a Course of Instruction in Bibliography. It consists of Lectures delivered once a week during the months of November and December. This Course is not one of those to be counted as meeting the requirements for a degree.

ARCHITECTURE AND DESIGN.

It is highly probable that the instruction in Architecture and Design, which was suspended in 1876, in consequence of temporary curtailment of the resources of the University, will be resumed in September, 1880, at the beginning of the academic year. Should it be resumed, the requirements for admission will be the same as for students of Civil Engineering.

It is thought desirable to give the following fuller statements than are found above concerning the instruction in certain branches.

THE SCIENCE AND THE ART OF TEACHING.

The Board of Regents, at their meeting in June last, in accordance with the recommendation of the President and the Faculty of this Department, established the Chair of the Science and the Art of Teaching.

The purposes are:

1. To fit University students for the higher positions in the public school service.

It is a natural function of the University, as the head of our system of public instruction, to supply the demand made upon it for furnishing the larger public schools with superintendents, principals, and assistants in high schools. Year by year these important positions are falling more and more into the hands of men who have received education in the University. Up to this time, the training given to our graduates has been almost purely literary; it has lacked the professional character that can alone give special fitness for the successful management of schools and school systems. Now, however, it is proposed to offer students of this University who wish to become teachers ample facilities for professional study; and this purpose is embodied in the establishment of this new Chair.

2. To promote the study of educational science.

The establishment of this Chair is a recognition of the truth that the art of education has its correlative science; and that the processes of the school-room can become rational only by developing and teaching the principles that underlie these processes. Systems of public instruction are everywhere on trial, and the final criteria by which they are to stand or fall must be found in a philosophical study of the educating art.

3. To teach the history of education, and of educational systems and doctrines.

The supreme right of the school is to grow; and much hurtful interference might be avoided by ascertaining the direction of educational progress and the history of educational thought.

4. To secure to teaching the rights, prerogatives and advantages of a profession.

5. To give a more perfect unity to our State educational system by bringing the secondary schools into closer relation with the University.

TEACHERS' DIPLOMAS.

Any one who pursues one of the Courses in the Science and the Art of Teaching, and some one other course of study with reference to preparation for teaching, and who by special examinations shows such marked proficiency as qualifies him to give instruction, may receive a special Diploma signed by the President and by the Professors who have charge of the studies he has taken with this object in view.

A special examination in the ancient and modern languages and mathematics for the Teacher's Diploma, will be held the week before the spring vacation. This designed to be the certificate of qualification for teaching, and is the only form of recommendation which will be given by the Professors in charge of these studies.

CIVIL ENGINEERING.

The University aims, by the course of study pursued in the department of Civil Engineering, to lay a foundation of sound theory, sufficiently broad and deep, to enable its graduates to enter understandingly on the further investigation of the several specialities of the profession, and at the same time to impart such a knowledge of the usual practice of an office, and of an engineering party, as shall make its students useful in any position to which they may be called. While the adaptation of theory to practice can be thoroughly learned only by the training of experience, there are many matters in which the routine of work of an engineering field party, office or drafting room can be carried out on a greater or less scale. In all such particulars the civil engineering course of the University will embody as close an imitation of the requirements of active labor as the instructors who have the several branches in charge can devise. All the technical branches are under the direct care of those who have had professional experience as well as a full scientific training. How the above objects are attained will be seen below.

Upon a successful completion of *twenty-four Full Courses*, including the required studies specified hereafter, and the presentation of a satisfactory thesis, with accompanying drawings, the student will receive the degree of Bachelor of Science (after 1881) in the Department of Civil Engineering. Students who are not candidates for a degree may pursue such studies as they prefer, provided they are found prepared to join the classes in those studies. They will be expected to attend all the lectures, recitations and examinations in those branches prescribed for the regular students, and will be required to take enough work to occupy them profitably. The time requisite for a careful and thorough preparation for the profession is not specified by the University; any student of ordinary diligence may complete all the work within four years. A second degree, of Civil Engineer, will be conferred upon candidates, after a sufficient interval of study and actual work; the precise conditions for obtaining it have not yet been definitely determined.

Bachelors of Arts, of Letters, and of Science of this University, and graduates of other Colleges, whose courses of study are equivalent to ours, are admitted to the same degree with the regular students after attendance on, and a satisfactory examination in, the technical subjects alone of this course as set forth in the schedule on the following pages, in addition to the Higher Mathematics, and Analytical Mechanics, there specified. These studies can be completed in two years. The culture imparted by classical or other liberal training will be found to have its uses for one engaged in the engineering work, and the previous discipline of the faculties in exact research will enable the professional student to master more easily the requirements of the course. All the time which the student can devote to general studies before taking up specialities will be well spent.

The work in surveying combines theory and practice as follows: A course of lectures and text-book work, in daily exercises, covers so much of one year as is not given to field work; all the operations of surveying, laying out work and computing, as well as the theory of instruments, are explained in detail. Every student is afforded abundant opportunity of becoming familiar, by actual use, with the excellent and full assortment of instruments owned by the University, embracing those usually employed in actual work, and numbering enough to equip well the parties. The classes in surveying are drilled in all the field work that pertains to that branch of engineering; they make surveys, traverse them, calculate contents divide areas, and solve problems in heights and distances, from data taken by the members themselves. They also determine the meridian and take observations for latitude. This work is done during the fall months; the finished plans of the surveys are made during the winter.

The classes in railroad engineering have practice in running levels and curves of different kinds, and in the measurement of earthwork. They are also, in the month of June, taken into the field as a railroad party, under competent supervision, for a space of four weeks continuously, when they go through all the field work for a projected line; reconnoissance, preliminary and location surveys, cross-sectioning, staking out, contouring and topography, doing all the work up to the point of actual construction. A plan and profile, carefully made in the field by each student from the notes of the party, completes this portion of the subject, and serves to fix the practical application of the principles obtained from the text-books and lectures. In the above work is usually included a plane-table survey, triangulation, and some hydrography, when the selected locality is favorable.

A course of instruction, by text-books and lectures, is given in Analytical Mechanics, the work being shaped especially for the needs of engineering students.

The study of the Strength of Materials and the Theory of Construction covers a course of recitations and lectures for an entire year. The text-book used is Rankine's Manual of Civil Engineering, supplemented with full explanations, additional lectures, examples and problems. A complete course of instruction is also given in the Graphical Analysis of Roof and Bridge Trusses and Arches, as recently developed and applied. The student is made familiar with both the analytical and graphical methods of treatment, and thus possesses ready proof of the accuracy of his calculations.

Contemporaneously with this course of study the class are required to work out problems in Engineering Design, or the application of the theory to actual cases. The students are furnished with the usual data for a design, and the kind or type of structure is indicated. They are then expected to make the necessary calculations for proportioning the different parts, and to present, at a specified date, complete working drawings, giving full details and figured dimensions, accompanied by bills of materials. The graphical method is applied to each problem.

A very complete course of Mechanical Drawing, with kindred studies, is also given. It embraces, first, Plane Projection Drawing and the elementary principles of coloring, shading, isometric projection, etc.; next, Descriptive Geometry, with original problems executed in the drawing room, followed by Free-hand Drawing, Topographical Drawing, Ornamentation and Lettering, Shades and Shadows, Linear Perspective and Drawing for Stone-Cutting. Lectures are given on Pure Mechanism, with work in drawing parts of machines. Examples from numerical data are always given in all branches and copying from the flat is avoided. The plans of surveys, plane-table work, maps, designs in engineering construction, and finally the Thesis Drawings, naturally come under this head, and all together give work in the drawing rooms almost daily throughout the course.

Finally a course of lectures is given upon the principles of Machine Construction, and upon the action of Turbines and other Water Wheels, the Steam Engine, etc.

The instruction is illustrated by models, drawings, photographs, lithographs, etc., including trusses, arches, details of construction, in iron, wood and stone, shapes of iron, working models of turbines, engines, etc., working drawings of a number of bridges, etc. These collections are receiving additions from year to year, by gifts and purchase, and are invaluable to the student. The latest and best books on professional subjects are added yearly to the library, where they are accessible to all, and frequent references are made to them in the class-room, as the various subjects are brought forward.

Examinations, usually written, are held at the end of each semester, but, at any time, without previous notice, the classes may be examined on any portion of their previous work, to test their actual knowledge.

For *Requirements for Admission*, see p. 26.

COURSES OF STUDY.

The courses of study required for graduation in the Department of Civil Engineering are as follows, the technical branches being printed in SMALL CAPITALS.

Mathematics.—Courses 1, 2, 3, 5, 6, 11; Part III. of Olney's Algebra, or an equivalent in other authors; Part III. of Olney's Geometry; Plane and Spherical Trigonometry; General Geometry, including Loci in Space; Differential and Integral Calculus, Analytical Mechanics.

Applied Mechanics.—Civil Engineering Course 7; Wood's Analytical Mechanics, with Lectures.

CIVIL ENGINEERING.—Courses 1, 2, 4, 8, 9; Rankine's Civil Engineering, Parts II. and III., and Lectures; Resistance of Materials and Theory of Structures; Principles of Stability and Strength; Beams, Trusses, Girders; Roofs and Bridges in Wood and Iron; Arches in Stone and Iron; Earthwork, Masonry, Retaining Walls, Foundations, Tunnels.

Flow and Distribution of Water; Sanitary and Hydraulic Engineering; Drainage and Sewerage, Canals and Tidal Works.

Engineering Design; Original Problems and Designs for Roofs, Bridges, and Structures of Wood, Iron and Stone; Working and Detail Drawings; Bills of Material, Diagrams and Strain Sheets.

[The above Courses will necessarily be taken nearly in the order of enumeration.]

DRAWING.—Courses 1, 2, 4, 5, 6; Civil Engineering Course 10; Geometrical Drawing; Plane Projection, Isometric Projection; Use of India Ink and Water Colors; Free-hand Drawing, Pen and Ink Drawing; Descriptive Geometry, with Problems; Topographical Drawing; Ornamentation and Lettering; Shades and Shadows, Linear Perspective; Stereotomy.

MACHINERY AND PRIME MOVERS.—Civil Engineering Courses, 5, 6; Lectures on Principles of Mechanism; Machine Drawing from Models and Machinery; Lectures on Theory and Construction of Machines; Water Wheels; Steam Engines.

[The above courses, also, must practically conform to the given order. The order of the Courses which follow is left to the discretion of the student, subject to the restrictions found on pp. 29–30.]

SURVEYING.—Courses 1, 2, 3, 4; Theory and Adjustment of Level, Transit, Compass, Solar Compass, Plane Table and Sextant; Henck's Field-book for Engineers; Rankine's Civil Engineering; Leveling, Topography, Staking out Work, Computation of Quantities, Preparation of Estimates; Field Practice; Drawing of Plans, Maps and Profiles.

ASTRONOMY.—Course 3; Spherical and Practical Astronomy; Computation of Time, Latitude and Longitude.

GRAPHICS OF STRUCTURES.—Civil Engineering Course 3; Stress Diagrams and Graphical Methods of Analysis; Greene's Trusses and Arches; Part I., Roof Trusses; Part II., Bridge Trusses; Part III., Arches.

French.—Courses 2, 6.—Grammatical Analysis; Translation into English and French.

German.—Courses 1, 3.—Whitney's Grammar, Exercises and Reader.

English.—Course 1 or Course 7.—English Grammar and Rhetoric; Theory and Practice.

Physics.—Course 2.—Mechanics, Acoustics and Optics; Experimental Lectures and Text-book.

Chemistry.—Course 2.—Elementary Chemistry, Heat, Electricity and Magnetism; Experimental Lectures and Class-room Work.

Mineralogy and Geology.—Courses 1, 5.—Mineralogy and Lithology; Dynamical and Structural Geology.

The studies just enumerated make *twenty and one-fifth Full Courses*, as defined on p. 60. From the other courses offered the candidate for a degree must choose and complete *three and four-fifths Full Courses*, making *Twenty-four Full Courses* in all; and he must also prepare a satisfactory thesis. It is suggested that this additional work, and such other extra work, if any, as the student's ability and length of residence may warrant his undertaking, shall be chosen from studies which will strengthen the *required* courses, rather than introduce new branches.

ADVANCED STUDIES.

An advanced course of study is offered to graduates of the Civil Engineering Course and to Resident Graduates. It will consist of:

CIVIL ENGINEERING.—Further investigations of the Theory of Construction, more especially in the direction of Continuous Girders, Revolving Draw-Spans, Rigid and Braced Arches, etc.

Also a more extended course on the Steam Engine and other Prime Movers.

PROJECTS IN ENGINEERING.

MATHEMATICS.—Calculus of Variations.

ASTRONOMY.—*Theoretical Astronomy.*—Numerical Calculus, Theory of Interpolation and Quadratures, Method of Least Squares. Calculation of the special and general Perturbations of Planets and Perturbations of Comets.

Physics.—Work in Physical Laboratory and Mathematical Theory of Light and Sound. Heat, Electricity and Magnetism.

Chemistry.—Qualitative and Quantitative Analysis.

MECHANICAL AND MINING ENGINEERING.

While there are no courses of instruction looking directly to these professions, the greater part of the studies prescribed for the students in Civil Engineering will be found needful by those students in Selected Studies who may wish to devote especial attention to these branches. The instruction specially useful to those who are looking to Mechanical Engineering is: Pure Mechanism, or the General Principles of Machinery, including Gearing, Cams, Screws, Cranks and Levers, with Problems and Machine Drawing; also lectures upon the Prime Movers, Water Wheels and the Steam Engine.

Those who are preparing for Mining Engineering will find assistance in pursuing the Courses in Mineralogy, and Historic and Economic Geology, and in studying in the Chemical Laboratory Qualitative and Quantitative Analysis and Metallurgy. There is a considerable collection of apparatus for illustrating studies in Mining Engineering.

Students in Selected Studies may also take up Rankine's "Machinery and Millwork," and Rankine's "Steam Engine and Other Prime Movers," a more extended course than is generally pursued by the candidates for graduation.

SPECIAL AND ADVANCED COURSES IN SCIENCE.

I. PALÆONTOLOGY.

Course 4 in the First Semester and Course 6 in the Second Semester are courses of advanced study provided for students who have completed Courses 1 and 5. They are not intended for a general presentation of the whole field of Palæontology, but for the detailed study of special branches, such as Brachiopods, Corals, Cephalopods, Fishes, Reptiles or Mammals, or the complete palæontology of particular formations. One of these special subjects will be taken up each semester. The subject for the First Semester of the current year is *Eozoon* and the *Stromatoporidæ.* That for the Second Semester is *Brachiopods.*

The student is placed in possession of the requisite materials, and directed in personal investigation. He is aided in carrying on this work by the usual accessories of cutting and polishing lathes, thick and thin sections and microscopes. He is required to execute drawings, both macroscopic and microscopic, to complete methodical records of his observations, and to prepare a thesis. He is referred to all accessible sources of information, and expected to possess himself of the results attained by the investigations of others. A general summary of the existing state of knowledge on the subject is to be embodied in his thesis.

The time required for this work is not less than two hours a day during five days each week.

No particular text-books can be cited here for these courses, since the authorities are various and numerous. In Brachiopods the student will be specially guided by manuscripts prepared by the Professor in charge.

II. ZOÖLOGY.

Special and advanced students will be allowed to elect any of the Courses heretofore described, or, if too far advanced to receive profit from these, will be given special work.

III. BOTANY.

Special courses in Botany are given during both semesters. They are offered to students who have already completed the elementary course in Structural and Physiological Botany.

In the First Semester a course of lectures is given on the special Morphology of Plants. A practical study of the leading groups of cryptogamic plants, with observations of their anatomy and physiology, is carried on in the Microscopical Laboratory. Special attention is paid to the study of Fungi, and their relations to other plants, and original investigation in this direction is encouraged as much as possible.

Sachs's "Text book of Botany," DeBary's "Morphologie und Physiologie der Pilze," Cooke's "Hand-book of the British

Fungi," an edition of Gray's Manual of Botany, containing the Mosses and Hepaticæ, Sullivant's "Icones Muscorum," and Hooker and Baker's "Synopsis Filicum," are among the most important works of reference.

In the Second Semester an advanced course in Structural and Physiological Botany is pursued. Lectures are given, accompanied by experimental work and a thesis on the part of the student. The plan of work this year will be essentially that indicated in Sachs's "Hand-buch der Experimental Physiologie." In addition to the text-books of Sachs, Johnson's "How Plants Grow," and "How Plants Feed," are recommended for reference.

These courses will be made as practical as possible. For this purpose the student will be expected to apply for a table in the Microscopical Laboratory, where all the necessary materials, microscopes, and other instruments will be provided at a cost only sufficient to cover actual expenses on the part of the University.

Instruction is given in Practical Microscopy, the use of Micro-Chemical Reagents, and other methods of observation, in drawing and measuring from the microscope, etc. The Microscopical Laboratory is open every morning from 8½ to 12½ o'clock. The charge for the use of microscopes, other instruments and materials, is at present fixed at two dollars for each semester or fraction of a semester, which amount must be deposited by each student with the Treasurer of the University before his application for a table can be entered. Students are responsible for the apparatus furnished them, and are required to make good any injury to the instruments under their charge.

Among the works of reference to be used in the Laboratory are Carpenter's "Microscope," the "Micrographic Dictionary," Schacht's "Mikroskop und seine Anwendung," Flückiger and Hanbury's "Pharmacographia," Berg's "Anatomischer Atlas," etc.

The Botanical Course in the School of Pharmacy is described in the chapter devoted to that School.

IV. PHYSICS.

The special and advanced work offered in Physics for the year 1879–80 includes in the First Semester a course in Theoretical Physics, twice a week, in which the student will gain some familiarity with the application of the calculus and other branches of Mathematics to physical questions; and a short course, once a week, in physical problems on the points at the time under discussion in the classes in experimental Physics.

In the Second Semester are offered a course in Advanced Acoustics, including the physical basis of Music, once a week, and during April and May a brief course of eight or ten lectures to students expecting to teach, discussing methods of teaching Physics and describing simple experiments, the construction and use of simple apparatus, text books, etc.

It is expected that before long an Advanced Course in experimental Physics, requiring five hours per week, will be offered, which may be taken in place of the present courses by such students as have studied Physics in the best High Schools of the State, or have made equal attainments elsewhere.

At present the principal advanced work offered is in the Physical Laboratory: beginners in this work must join the classes in the Second Semester, but advanced students may be allowed to pursue their work during the First Semester. More attention will hereafter be given to the special needs of students expecting to teach. The rooms devoted exclusively to the Department of Physics, extend in a direct line over 125 feet, and are lighted from the north, east and south, and are provided with steam, gas and water.

In the Physical Laboratory a systematic course in physical measurements is provided; such a course as will give the student familiarity with apparatus and its manipulation, a clearer understanding of the methods by which the important tables of the text-book have been made out, and confidence in their accuracy. For this purpose apparatus has been provided for the accurate determination of weights and measures, linear and cubic, of specific gravity, elasticity of bodies, strength and stiffness of beams, and simple structures as trusses, bridges, etc.; for the flow of liquids and gases, for many measures of rates of vibration of sounding bodies, of the index of refraction in solids and liquids, of wave length of lines in the solar spectrum, and in the spectrum of common materials, of the intensity of light, and of the amount of light absorbed by various shades, etc.; of the strength of galvanic batteries, and the resistance of conductors, of specific and latent heat, etc., etc.

The plan followed is in the main the one developed through many years of successful operation at the Massachusetts Institute of Technology, modified as may be necessary to meet the wants of advanced or special students. Pickering's "Elements of Physical Manipulation" is used as a text book. It is, of course, understood that in this course the students perform all the experiments themselves.

As the schedule is at present arranged, work in the Laboratory comes in the Second Semester, and follows naturally on the text-book work of the first; there will then remain time during the college course for advanced or original work, if the student desires it.

Those desiring to become familiar with the ordinary apparatus and lecture experiments can also be accommodated to a considerable extent. No extra fees are required for any of the work in Physics.

V. ASTRONOMY.

The Course in Higher Astronomy embraces two years. The following subjects give direction to the lectures of the course:

Formation of the Fundamental Equations of Motion. Integration of the Equations for Undisturbed Motion, and Determination of the Elements of the Orbit. Theory of Interpolation. Calculation of Ephemerides.

Calculation of the Orbits of the Celestial Bodies from Three or more Observations. Correction of the Elements. Combination of Observations by the method of Least Squares. Special and General Perturbations. Determination of Time, Latitude and Longitude.

Theory of the Instruments.

During the course the student has access to the instruments of the Observatory, under the special direction of the Professor, and is permitted to take part in the observations.

VI. GENERAL CHEMISTRY.

In addition to Courses 1 and 2 on the subjects of Chemical Physics and General Chemistry, which are mentioned on page 39, the following are offered for advanced work in General Chemistry.

COURSE 3. Chemical Philosophy and the Kinetic Theory of Gases. *Twice a week by lectures.*

Considerable familiarity with the principles and facts of chemistry will be required before the student enters upon this work. The minimum preparation for it is Course 2, but students are advised to take also in addition one of the two courses below, or one or more of those offered in Analytical Chemistry, because the higher forms of chemical theory cannot be understood without an extensive acquaintance with the details of the science.

COURSE 4. As the Physical Sciences are preëminently experimental, it is impossible to acquire a practical knowledge of them from books alone. In Chemistry this want is largely supplied by the instruction given in the Laboratory of Analytical and Applied Chemistry; but while analysis presents one mode of the study of Chemical Science, and is alike indispensable to the extensive prosecution of pure chemistry and of the applications of chemistry to practical life, it occupies only a portion of the field of chemical science. Courses 4 and 5 make use of laboratory methods, but for general, as distinguished from technical, purposes.

Each student is supplied with a table and apparatus; no text-book is used, but in its place daily circulars outline a course of experiments supplemented by references to works in the library. Students make investigations and draw conclusions which are reviewed from time to time in the class-room. *This Course is given three times a week, occupying the afternoons.*

COURSE 5. Is the same as the above, but continued *five times a week*, or it may be varied by employing three days as in Course 4, and adding two days in modes of experimentation especially employed by teachers and lecturers.

Both of the above courses demand a consumption of materials which are furnished by the University; therefore, a deposit of ten dollars must be made before commencing work; a fixed charge of five dollars per semester is made for gas and chemicals. Uninjured apparatus may be returned at the issuing price.

Course 3 is offered in the Second Semester, and Courses 4 and 5 in the First Semester.

To students desiring a competent knowledge of General Chemistry, the following electives are suggested: First year, Course 2 in Physics in the First Semester, and Course 2 in General Chemistry in the Second Semester. Second year, Course 5 for the First Semester, and Course 3 for the Second Semester, both in General Chemistry.

To those who desire to study Analysis, Courses 1 or 2 and 4 in General Chemistry are suggested as furnishing a good preparation for work in Applied Chemistry.

VII. ANALYTICAL AND APPLIED CHEMISTRY.

The Laboratory of Analytical and Applied Chemistry provides systematic instruction, with suitable appliances, in convenient rooms, for the various branches of chemical analysis, and for physiological chemistry, pharmacy, and metallurgy. In all of the courses there are recitations and lectures in the class-room, giving direction to the daily practice of the student at his table, and demanding his immediate study of the work undertaken. The method of laboratory teaching makes it indispensable that the student begin with a class. The schedule of courses, with the time of each, for students in the Department of Literature, Science and the Arts, is given on pp. 39-40. Other courses are presented for study in the Department of Medicine, and in the School of Pharmacy, as may be found, in detail, by reference to these departments.

The beginner, in the Course of *Qualitative Analysis*, forms an acquaintance with the metallic elements and their combinations with non-metallic bodies,—making an experimental study of solubilities, and a critical inquiry into synthetic changes. From this foundation he proceeds to the identification and separation of substances. In the Course of *Quantitative Analysis*, the student obtains further training in exactness of operation, verifies the constants of science by computing his own results, and may then practice in determinations needed in the natural sciences, or in valuation of articles in common use.

Those who have prepared themselves in qualitative and quantitative analysis may engage in *original investigations*, with the necessary search of authorities. With previous completion of the course in proximate organic analysis, or that of physiological chemistry, researches in the chemistry of plants, or of animal life, may be undertaken. Earnest encouragement and coöperation are promised to all those, who, with due preparation, will enter upon original work.

Students desiring to qualify themselves as General Analysts, and for *detection of impurities in articles of commerce*, should complete the work in qualitative and quantitative analysis, and then take three of the courses of the School of Pharmacy, namely: micro-botany, proximate organic analysis, and organic chemistry.

In preparation for the duties of *the Assayer and Metallurgist*, after the qualitative work, and a special course in quantitative analysis, the student takes a course in Blow-pipe Analysis of Minerals, and one in Assaying. These may accompany the elective courses in Metallurgy, Mining, Geology, and courses in Engineering, and may be pursued with the studies required for the degree of B. S.

Training in Analytical Chemistry as the principal object, duly strengthened by the study of physics, the natural sciences and the modern languages, and constituting a most suitable education for the profession of *an Analytical and Consulting Chemist*, may be obtained in the courses required and elective for the degree of Bachelor of Science. With this object it is necessary that the mathematics be so far advanced in the First Year that the physics and general chemistry can be obtained in the Second Year.

Students may obtain opportunity for special studies in the Laboratory by complying with the requisites for admission, and the regulations of study in a department of the University to which the desired special studies properly belong.

EXPENSES OF THE LABORATORY.—It is the design of the Regents that the chemicals and apparatus actually consumed in the individual manipulations of the student shall be paid for by him. With this view, the student on entering the Laboratory makes a deposit of ten dollars, a complete suit of apparatus is inventoried to him, and from time to time additional supplies are furnished. An accurate account is kept. On leaving the Laboratory he is credited with what may remain unconsumed, and the balance is struck. All supplies are furnished the student at the printed price current of New York dealers. The Laboratory expenses of students will vary with their prudence and economy. Experience has shown that the average is about one dollar and twenty cents per week for all Laboratory courses.

REQUIREMENTS FOR GRADUATION.

PRELIMINARY EXPLANATION.

1. Five exercises a week during a semester, whether in recitations, Laboratory work, or lectures, shall constitute a *Full Course of study*. The completion of *twenty-four such Full Courses* is required to obtain the recommendation of the Faculty for the degree of Bachelor of Arts, or of Civil Engineer, or of Mining Engineer. The completion of *twenty-six such Full Courses* is required to obtain the recommendation for the degree of Bachelor of Philosophy, or of Bachelor of Science, or of Bachelor of Letters.

2. It is not essential that the exercises constituting a *Full Course* shall be in one and the same branch of study. Thus, a part (two, for instance) may be in Mathematics, a part (say two) in Greek, and a part (say one) in Latin, etc., making a total of five.

THE DEGREE OF BACHELOR OF ARTS.

To obtain the recommendation of the Faculty for the degree of Bachelor of Arts, the student *must* complete

Courses 1, 2, 3, 6, 7 or 12, 13,	in Greek.
Courses 1, 2, 6, 8,	in Latin.
Courses 1, 2, 5, 6,	in Mathematics.
Courses 1 or 7, and 2 or 8,	in English.
Course 1,	in Philosophy.
Course 1,	in Physics.
Course 1,	in General Chemistry.

These make *twelve and two-fifths Full Courses.* From the other courses offered the student must choose and complete enough to be the equivalent of *eleven and three-fifths more Full Courses*, making in all twenty-four Full Courses.

THE DEGREE OF BACHELOR OF SCIENCE.

[*The degree of Bachelor of Science will after* 1881 *be given to those who complete the studies in Civil Engineering and Mining Engineering.*]

To obtain the recommendation of the Faculty for the degree of Bachelor of Science the student *must* complete

Courses 1, 2, 5, 6,	in Mathematics.
Courses 2, 6,	in French.
Courses 1, 3,	in German.
Courses 1 or 7, and 2 or 8,	in English.
Course 1,	in Philosophy.
Course 2,	in Physics.
Course 2,	in General Chemistry.
Course 2,	in Astronomy.
Course 1,	in Zoölogy.
Course 3,	in Botany.
Courses 5, and either 1 or 4,	in Drawing.

These make *thirteen and one-fifth* (or if Drawing 4 be taken) *thirteen and two-fifths Full Courses.* He *must* also elect at least

1. In History, the equivalent of one Full Course.
2. In Mineralogy and Geology, the equivalent of one Full Course.

3. In the Chemical or the Physical Laboratory, one Full Course.

4. In the Microscopical Laboratory, one Full Course.

5. And in addition to these, from scientific studies the equivalent of three Full Courses.

From the other courses offered in the Department of Literature, Science and the Arts, he must choose and complete enough to make in all *twenty-six Full Courses.*

THE DEGREE OF BACHELOR OF PHILOSOPHY OR OF BACHELOR OF LETTERS. (LATIN.)*

To obtain the recommendation of the Faculty for the degree of Bachelor of Philosophy, or of Bachelor of Letters (Latin), the student *must* complete

Courses 1, 2, 6, 7, 8, . .	in Latin.
Courses 1, 2, 5, 6, . . .	in Mathematics.
Courses 2, 6, . . .	in French.
Courses 1, 3, ...	in German.
Courses 1 or 7, and 2 or 8, .	in English.
Course 1, ...	in Philosophy.
Course 1, ...	in Physics.
Course 1, ...	in General Chemistry.
Some one Full Course, . .	in Science.

These make *thirteen and one-fifth Full Courses.*

From the other courses offered he must choose and complete enough to form the equivalent of *twelve and four-fifths Full Courses*, making in all *twenty-six Full Courses.*

THE DEGREE OF BACHELOR OF LETTERS.

To obtain the recommendation of the Faculty for the degree of Bachelor of Letters the student *must* complete

Course 10, ...	in Mathematics.
Courses 1, 2, 5, 6, . . .	in French.
Courses 1, 2, 3, 4, 5, . . .	in German.

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* The Degree of Bachelor of Philosophy will be conferred until 1881, and thereafter instead of that, the degree of Bachelor of Letters (Latin), will be given.

Courses 1 or 7, either 2 or 8, 4, either 5 or 9, 10,	in English.
Course 1,	in Philosophy.
Some two *Full Courses* (to be chosen),	in Science.

These make *eleven and two-fifths Full Courses.* From the other courses offered the student must choose and complete the equivalent of *fourteen and three-fifths Full Courses*, making in all *twenty-six Full Courses.*

THE DEGREE OF CIVIL ENGINEER.*

To obtain the recommendation of the Faculty for the degree of Civil Engineer the student *must* complete

Courses 1, 2, 3, 5, 6, 11,	in Mathematics.
Courses 2, 6,	in French.
Courses 1, 3,	in German.
Course 1 or 7,	in English.
Course 2,	in Physics.
Course 2,	in General Chemistry.
Course 1,	in Mineralogy.
Course 3,	in Astronomy.
Courses 1, 2, 4, 5, 6,	in Drawing.
Courses 1, 2, 3, 4,	in Surveying.
Courses 1 to 10 inclusive,	in Civil Engineering.

These make *twenty and one-fifth Full Courses.* From the other courses offered he must choose and complete *three and four-fifths Full Courses*, making *twenty-four Full Courses* in all.

He must also prepare a satisfactory thesis.

REQUIREMENTS FOR THE HIGHER DEGREES.

1. To obtain the recommendation of the Faculty for the degree of Master of Arts, the student must, while residing at the University, complete six full courses in addition to the twenty-four required for the degree of Bachelor of Arts; and must present a satisfactory thesis to the Faculty.

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*This degree will be given until 1881. After that date the degree of Bachelor of Science will be given to those who complete the studies above named, and that of Civil Engineer will be conferred only as a second degree.

2. To obtain the recommendation of the Faculty for the degree of Master of Science, the student must, while residing at the University, complete four full courses in addition to the twenty-six required for the degree of Bachelor of Science, and must present a satisfactory thesis to the Faculty. The choice of at least three of the four courses, and the subject of the thesis is limited to the physical and biological sciences.

3. To obtain the recommendation of the Faculty for the degree of Master of Philosophy* the student must, while residing at the University, complete four full courses in addition to the twenty-six required for the degree of Bachelor of Philosophy, and must present a satisfactory thesis to the Faculty.

4. To obtain the recommendation of the Faculty for the degree of Master of Letters the student must, while residing at the University, complete four full courses in addition to the twenty-six required for the degree of Bachelor of Letters, and must present a satisfactory thesis to the Faculty.

5. A student may be recommended for a Master's degree without having taken the Bachelor's degree, provided he give notice of such a purpose at least one year before he applies for the degree, and choose courses which are approved by the Faculty, and present a satisfactory thesis to the Faculty.

6. Bachelors of Arts, Bachelors of Science, Bachelors of Philosophy, and Bachelors of Letters, graduates of the University, who have not resided here since graduation, but who at a date not earlier than two years after graduation shall, on examination, show special proficiency in literary or scientific studies, and present a satisfactory thesis to the Faculty, will be recommended respectively for the degrees above described, (1, 2, 3, 4.)

7. The degree of Doctor of Philosophy is open to the graduates of the University, or of any other reputable University or College, who shall have satisfied the Faculty on examination that they have made special proficiency in some one

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*This degree will not be conferred after 1881. In its place the degree of Master of Letters will be bestowed.

branch of study, and good attainments in two other branches to be specified by the Faculty. They will be expected to reside here, and to perform an amount of work which will occupy at least two years. It is intended that the degree of Doctor of Philosophy shall not be won merely by faithful and industrious work in some assigned course of study, but that the successful candidate shall evince power of original research, and of independent investigation.

Persons who are not graduates will be received as candidates for this degree, if they satisfy the Faculty that they have made attainments equivalent to those required here for the degree of Bachelor of Arts, Bachelor of Philosophy, or Bachelor of Science.

8. After the current academic year (1879-80), candidates for Master's degrees will be required to present their theses at a date not later than the first day of the Second Semester; and candidates for the degree of Doctor of Philosophy will be required to present their theses by the first day of December, in the second year of their study for that degree.

9. All theses for the higher degrees will be read and defended, if need be, in public.

STUDIES, ATTENDANCE AND DISCIPLINE.

Without special permission of the Faculty no student can drop any course of study until he shall have attended the regular examinations in the same.

Such delinquencies as tardiness, absence, deficiencies, offenses against good order, in the several departments of instruction, are ordinarily dealt with by the Professor in charge of the department in which they occur. Flagrant cases are reported to the faculty for adjudication.

Students who are not in their places at the opening of the semester must present written excuses from their parents or guardians for the delay.

Students are not allowed to absent themselves from town without permission of the President.

The State of Michigan extends the privileges of the University, without charge for tuition, to all persons of either sex, who are qualified for admission. Thus it does not receive patronage, but is itself the patron of those who seek its privileges and its honors. It cannot, however, be the patron of idleness or dissipation. Its crowded classes have no room except for those who assiduously pursue the studies of their choice, and are willing to be governed in their conduct by the rules of propriety.

Students are suspended or dismissed, whenever, in the opinion of the Faculty, they are pursuing a course of conduct seriously detrimental to themselves or the University.

The following are extracts from the by-laws of the Regents:

"Concerted absence from any appointed duty by a class or any number of students together, will be regarded as a great violation of good order, and will be followed by suspension or dismission, at the discretion of the Faculty."

"Whenever any Faculty is satisfied that a student is not fulfilling, or likely to fulfill, the purpose of his residence at the University, or is for any cause an unfit member thereof, the President shall notify his parents or guardians, that they may have an opportunity to withdraw him, and if not withdrawn within a reasonable time he shall be dismissed."

The following rules concerning examinations have been adopted by the Faculty:

1. Any student who is found using illegitimate helps for passing an examination thereby renders his examination void, and shall not be re-examined until the next regular examination in the Course which he has thus failed to pass.

2. The requirement above mentioned shall also apply to any student who is absent from any regular examination without permission.

3. Any student who is enrolled as a member of a class, whether he be a candidate for a degree or not, is required to attend the examination of the class: and any violation of this rule shall be deemed a forfeiture of the privileges of this Department of the University.

4. A student who is reported as "*Not Passed*" shall receive no credit for the work pursued, and shall be required to pursue the course again in the regular class-room exercise.

5. A student who is reported as "*Conditioned*" must remove the deficiency not later than *one year* from the date of the examination in which the condition was incurred; otherwise, the study which was passed conditionally shall count for nothing towards graduation.

6. A student whose examination is reported as "*Incomplete*" shall be credited with his work only after passing a supplementary examination.

DEPARTMENT
OF
Medicine and Surgery.

I. IMPROVED AND EXTENDED COURSE OF INSTRUCTION.

The Course of instruction now comprises *three* collegiate years of *nine months* each. Students who matriculated prior to 1880 will, however, be allowed to graduate upon the conditions which were in force at the time of their matriculation.

The college year begins October 1st, and ends in the last week of June. It is divided into two semesters to correspond with the arrangement in the Literary Department.

In this extended Course the studies are arranged in the following order:

FIRST YEAR.—Anatomy, Physiology, Chemistry, Materia Medica and Therapeutics.

SECOND YEAR.—Continuation of Anatomy, Physiology, Chemistry, Materia Medica and Therapeutics; with Pathology, Medical Chemistry and Clinical Medicine and Surgery.

At the end of the second year final examinations take place in Chemistry, Anatomy, Physiology, Materia Medica and Therapeutics.

THIRD YEAR.—Practice of Medicine, Surgery, Obstetrics and the Diseases of Women and Children, Ophthalmology and Otology, with Clinical Medicine and Surgery.

The above list will be understood to include all the special studies which appertain to and form an essential part of the general subjects enumerated. Such are; Histology Physiological and Pathological; Laboratory work in Medical Chemistry in Microscopy and in Electro-Therapeutics; Qualitative, Physiological and Pathological Analyses; Toxicology; Physical Diagnosis, etc.

Students properly qualified but who are not candidates for the degree of M. D., may enter the college at any time, and pursue such studies as they may select, receiving special certificates for the time spent and for the subjects pursued. Students may also be admitted to advanced standing, by passing a satisfactory examination in the studies already pursued by the class into which entrance is desired; but no student will be admitted to examination for the third or Senior year unless he has already attended a full course of lectures at some Medical College in good standing with the profession. Students who may thus be admitted to advanced standing will be required before graduating to furnish a certificate of having been engaged in the study of medicine under a competent preceptor three full years including the time spent in college. Such certificate will not be required of students who take the full Course (three years) of study in this college.

The final examinations will be conducted, in part at least, in writing. Written examinations will also be held in the closing week of each semester and the student may be called upon to write upon some theme assigned by the instructor or selected by himself, the essay, if required, to be defended before the class. In consequence of the prominence given to written examinations through the Course, no graduating thesis will be required.

II. THE LECTURE COURSE.

In accordance with these arrangements the thirty-first annual course of lectures will commence on Friday, October 1st, 1880, and continue until the last Tuesday of June, 1881, with a recess during the holidays.

Four didactic lectures will be delivered daily. Quizzes upon the subjects of these lectures will also be held daily by the assistants to the various chairs. Clinics are held in the college every Wednesday and Saturday, for both medical and surgical cases, at which time examinations are made, prescriptions given, and surgical operations performed, gratuitously to patients, in the presence of the class.

III. TERMS OF ADMISSION.

Every candidate for admission to the Department of Medicine and Surgery must be eighteen years of age, and must present to the Faculty satisfactory evidence of a good moral character.

Unless already graduates or matriculates of the University or of some literary or scientific college, or graduates or advanced members of some academy or high school, or unless holding certificates from some public school board of being properly qualified as teachers, or unless having certificates based upon an examination by some regular medical society of being properly qualified to engage in the study of medicine, all candidates must be examined as to their elementary education and their fitness to enter the college and pursue properly and profitably the technical study of medicine. The examination will be in writing and will include an account of the candidates' educational advantages, and answers upon such questions of Arithmetic, Geography, History, Forms of Government and current events as shall show their general intelligence; and particularly will they be required to correct imperfect English, and to show their ability to express ideas correctly in writing. Since many present themselves a long time after completing their school education, the examination will not be technical, nor in the rules of school books, which are often soon forgotten, but it will be more to exhibit the results of previous training, and to indicate their present practical capacity, and their ability to appreciate the technical study of medicine. Such an examination is believed to be quite as effectual in guarding the profession from the introduction of illiterate and unworthy members as the requirements of a limited specified amount of school-book knowledge, to be studied up for the occasion.

These preliminary requirements are not now of as high an order as it is hoped they will before long be made, but they are intended to be as exacting as is fairly practicable and consistent with the interests and rights of the profession and the people.

Examinations will be held at 2 P. M. on Wednesday and Thursday, September 29 and 30, 1880. Candidates are required to present themselves on one of these days, as they are expected to be in attendance on the first day of the term, at which time the regular course of instruction will commence. To provide for cases in which it is absolutely impossible for the candidates to be present at this time, supplementary examinations will be held at such times as may be determined upon by the Faculty, but no excuse, except of an urgent character, will be accepted for failure to appear at the first examination.

Before admission to examination every student is required to present to the Dean of the Faculty the Treasurer's receipt for the payment of the matriculation fees and annual dues. It will therefore be necessary for the candidates to apply first to the Steward at his office in the University Hall, register their names as students in the Department of Medicine and Surgery, and then pay their fees to the Treasurer. In case of rejection, the money paid preliminary to examination will be refunded by the Treasurer.

In answer to many inquiries, it is thought desirable more explicitly to state, that no previous study of medicine is required for admission to the college, any person of proper moral character, and who possesses the above described requisite elementary education, being eligible for admission.

IV. ADMISSION OF WOMEN.

Women are admitted to this College, as to all other Departments of the University, on the same conditions that are required of men. It is proper to state, however, that the course of instruction for women, though equal in all respects to that provided for the men, is for the most part, given separately, the two classes being together only in the study of Chemistry and at the public clinics. Ample provision has been made for the women's classes in the way of lecture rooms, dissecting rooms, etc.

V. CONDITIONS OF GRADUATION.

To be admitted to the degree of Doctor of Medicine, all students must present evidence of the possession of a good moral character, of being twenty-one years of age, of having successfully pursued the study of Practical Anatomy and Practical Chemistry, and (unless the full course of study has been taken in this college) of having been engaged in the study of medicine for the period of three years, including the time spent in attendance upon lectures. He must also have passed satisfactory examinations on all the studies included in the full course of instruction, and if admitted to advanced standing in this college, he must have attended at least two full courses of medical lectures, the last of which must be at this college.

It is proper to remark that the two medical schools in this University are distinct organizations, and that, under the regulations established by the Regents, the professors in one school are not called to take any part in conducting the final examinations of students in the other, or in recommending them for graduation, or in signing their diplomas.

VI. FACILITIES FOR INSTRUCTION.

The Department of Medicine and Surgery is abundantly supplied with plates, photographs, models, specimens, preparations, apparatus and instruments, for the purpose of illustrating the different studies embraced in the course. The apparatus in the Department of Chemistry and of Chemical Physics, is probably unsurpassed, if indeed it be equalled, by that of any medical college in the country. Additions are made from time to time to these collections by special appropriations by the Board of Regents, so that the Faculty are able to adopt every new method of illustration, and to exhibit to the classes each year all important improvements in the way of instruments and apparatus that are employed in the practice of medicine and surgery, and to show their application.

The museums of Professors Ford and Sager, embracing several thousand specimens, which are the result of many years' labor in the collection and preparation of materials intended to aid directly in teaching, have now become the property of the University, and are used in the daily work of the classrooms. These museums contain a valuable collection of bones, illustrating healthy as well as diseased conditions, and showing the various changes that occur from infancy to old age, and the processes of first and second dentition; dissections, general and partial, of the vascular, nervous and muscular systems, both normal and abnormal; models in wax, papier maché and plaster, of various portions of the body, illustrating morbid growth, skin diseases, etc.; preparations in the comparative embryology, neurology and craniology of the vertebrata; human embryology, and anatomy and pathology of the diseases of women, etc. The collection of monstrosities, both single and double, of man and the lower animals, is one of the largest in the United States.

The department of the museum illustrative of Materia Medica, consists of a very complete suite of crude organic medicinal substances, embracing between five and six hundred specimens imported from Paris, finely displayed and arranged according to their order in natural history; besides about one thousand other specimens of simple mineral and vegetable substances, and pharmaceutical and officinal preparations, active principles, etc., arranged in groups convenient for study. Medicinal botany is further illustrated by between one and two hundred large finely colored plates.

The above collections, to which additions are made yearly, are catalogued and arranged in cases. The museum thus affords a secure depository for objects of interest and value, and it is to be hoped that the alumni and other friends of the University will continue their generous donations of such materials.

Ample supplies of material for the purposes of practical anatomy are always on hand, and special attention is given to this important study. Material for this work is furnished as abundantly, and at as low rates as at other institutions of the kind.

The Chemical Laboratory is one of the largest and best equipped in the United States, and every student before he can receive the degree of M. D., is required to take a course of practical medical chemistry, which requires, according to the expertness of the student, from ten to sixteen weeks of Laboratory work for two or three hours each afternoon when the lectures are not being delivered.

The required work in the Laboratory of Chemistry consists of two branches, Qualitative Chemistry, and the Analysis of Urine. In the first branch—Qualitative Chemistry—students are taken in classes of limited numbers, for daily drill in the class-room, to direct the daily practice in the Laboratory. The work of each class continues about seven weeks, after a week of class drill in notation, the classes commencing at such several times of the college year as will be announced in advance. Secondly, Analysis of Urine, in daily Laboratory practice, for five to seven weeks, with accompanying lectures.

By action of the Faculty of the College of Medicine and Surgery, two extended *optional courses* have been established, one in Physiological and Pathological Chemistry, and another in Toxicology. The *first* will embrace analysis of the Blood, Urine, Gastric Juice, Brain, Bile, Bone, Muscles, and other fluids and solids of the body. The *second* will embrace courses of Qualitative and Quantitative Analysis, and the special examination of foods and of the tissues and fluids of poisoned animals, for the detection of the various mineral and organic poisons. Each of these special courses, which are not required for graduation, employ about one collegiate year of Laboratory work. Students willing to devote time to *original work* in physiological chemistry or other branches, after due preparation, are given the fullest encouragement and coöperation. Also, courses in Quantitative Analysis, and in Pharmaceutical Preparations, are open to students of medicine who may desire such special training.

By an act of the Legislature of Michigan, a liberal appropriation for the equipment and conducting of a Physiological Laboratory has been made; and microscopes, a stereopticon, sphygmograph, and numerous other instruments for extended practical work have been procured, and are in daily use. By the coöperation of the Professors of Anatomy, Physiology, and Pathology, and with efficient instructors the students in the College of Medicine and Surgery, without additional charge, thus have opportunities of practical instruction in Experimental Physiology and Histology, both physiological and pathological; and this, supplemented by instruction in Pathological Anatomy and Medical Chemistry, is designed to afford facilities to students for minute and specific scientific study and research exceedingly rare in this country, the want of which is deeply felt by all advanced medical practitioners.

Junior students will have an opportunity under competent instruction to study Comparative Anatomy and Physiology practically by dissecting various animals, and while becoming familiar with structures and tissues, will also acquire dexterity in the use of instruments preparatory to work upon the human cadaver.

Recognizing the importance of combining clinical with didactic instruction, College Clinics have for years past been conducted on Wednesdays and Saturdays during the session, for Medical, Surgical and Ophthalmic patients. These are examined, prescribed for, and when necessary, operated upon before the class; and large numbers, especially of chronic cases, from this and neighboring States, have availed themselves of these privileges.

By the liberality of the last two Legislatures of the State of Michigan, aided by the city of Ann Arbor, and under the care of the Board of Regents, a Hospital has been established, and new pavilion buildings have been erected upon the University grounds of sufficient capacity for a large number of patients. It is now thoroughly equipped and well supported, and is in immediate charge of a competent house surgeon and physician and an experienced matron. The whole is placed under the direction of the Faculty of the College whose members will regularly attend (each upon such cases as come within his special department) upon the patients, and will give careful clinical instruction in the wards to the advanced students of the College. A new and spacious clinical amphitheatre in connection with the hospital has this year been erected by the Regents.

The Hospital will be kept open for patients applying from this and other States during the whole year, the only restriction being that no contagious diseases are admitted.

The expense to patients will be only for their board and for unusual appliances and medicines, the services of the Faculty being rendered gratuitously.

Under the present organization, patients are much better accommodated, and clinical instruction is rendered more systematic and efficient than has hitherto been possible.

Besides these aids in study, the students in medicine are allowed free access to the general botanical, zoological and geological cabinets of the University, which are estimated to contain 225,000 specimens. The General Library contains about 28,000 volumes, of which some 2,000 are medical works. A complete catalogue of the library, arranged both by the names of authors and by subjects, is accessible to all students. The leading medical periodicals of this country and of Europe are taken and kept on file in the Library.

VII. FEES AND EXPENSES.

The fees,* which must be paid in advance, are as follows:

MATRICULATION FEE.—Residents of Michigan, $10; non-residents, $25.

ANNUAL DUES.—Residents of Michigan, $20; non-residents, $25.

GRADUATION FEE.—For all alike, $10.

The admission or matriculation fee is paid but once, and entitles the student to the privileges of permanent membership in any department of the University. The annual tax is paid the first year, and every year thereafter. For other details of expenses, see pp. 21–22.

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* No portion of the fees can be refunded to students who leave the University during the academic year, except by order of the Board of Regents.

VIII. TEXT AND REFERENCE BOOKS.

Any of the following text-books in each department will answer the necessities of the student; and wherever a preference exists, it is given to those first in order on the list.

Anatomy.—Gray, Wilson, Leidy, Peaslee, Stricker.

Histology—Frey's Compendium of Histology. Stricker.

Physiology.—Dalton, Flint, Foster, Küss, Kirke. *For Reference.*—Carpenter, Sanderson's Handbook for the Physiological Laboratory, Foster and Langley's Practical Physiology.

Chemistry.—*In General Chemistry.*—Miller's Chemical Physics, Miller's Inorganic Chemistry, or Eliot and Storer's Manual of Chemistry. *For Laboratory.*—Douglas and Prescott's Analysis, Vaughan's Physiological Chemistry, Wormley on Poisons.

Materia Medica and Therapeutics.—H. C. Wood, Jr., Stillé, Waring, Ringer, Biddle. *Special Subjects*—Headland on the Action of Medicines, Anstie on Stimulants and Narcotics, Harley on the Old Vegetable Neurotics.

Pathology and Pathological Anatomy.—Wagner, Green, Rindfleisch, Billroth, Paget, Williams's Principles. *For Reference*—Rokitansky and Virchow.

Obstetrics.- Playfair, Meadows, Leishman, Tyler Smith, Byford, Schrœder, Cazeaux, Hodge. *Special Subjects*—Tanner on Pregnancy, Barnes on Obstetric Operations, Elliott's Obstetric Clinic, Barker on Puerperal Diseases.

Diseases of Women.—Thomas, Emmet, Byford, Hewitt, West, Barnes, Hodge. *Special Subjects*—Tilt on Uterine Therapeutics, Klob on Pathological Anatomy of the Female Sexual Organs, Peaslee on Ovariotomy, Sims on Uterine Surgery, Emmet on Vesico-Vaginal Fistula.

Diseases of Children.—J. L. Smith, Vogel, Tanner, Meigs and Pepper. *Special Subjects*—Eustace Smith on the Wasting Diseases of Infancy and Childhood, Combe on the Management of Infancy, Routh on Infant Feeding, Holmes or Guersant on the Surgical Diseases of Children.

Practice of Medicine.—Aitkin, edited by Clymer, Niemeyer, Roberts, Flint, Watson, Tanner, Wood. *Special Subjects.*—Walshe or Flint on the Lungs, Williams on Pulmonary Consumption, Flint or Stokes on the Heart, Roberts or Beale on Urinary Diseases, Budd on the Stomach, Chambers on Indigestion, Murchison on the Liver, Da Costa on Medical Diagnosis, Loomis on Physical Diagnosis. *For Reference.*—Reynold's System of Medicine, Trousseau's Clinical Lectures, Ziemssen's Cyclopedia.

SURGERY.—Syme, edited by Maclean, Erichsen, Hamilton, Druitt. *Special Subjects*—Billroth on Surgical Pathology, Hamilton on Fractures and Dislocations; Bumstead on Venereal Diseases; Sayre on Club Foot; Sir Henry Thompson or Gouley on Genito-Urinary Organs; C. Henri Leonard on Bandaging. *In Minor Surgery and Surgical Appliances.*—Bell, Le Gros Clarke, Anandale, Wales, Sargent. *For Reference*—Gross's System of Surgery; Holmes's System of Surgery.

OPHTHALMOLOGY AND OTOLOGY.—*On the Eye*—Sœlberg Wells, Stellwag, Metz, Brown on the Ophthalmoscope. *On the Ear*—Roosa or Toynbee with Hinton's Supplement, Burnett's Treatise on the Ear.

The student, who is commencing a course of reading without an instructor, is recommended to devote the most of his time for the first year to the elementary branches, Anatomy, Physiology, and Chemistry, both general and medical; then advancing to the other studies to select one of the first mentioned text-books in each department, passing to the "*special subjects*" only when near the completion of the course, or as he may desire for particular reasons to become more fully informed on such subjects. The books mentioned are standard authorities, and will form a good nucleus for a medical library.

IX. ASSIGNMENT OF SEATS.

Students on arriving in Ann Arbor can obtain the necessary information in regard to rooms, board, etc., by calling at the Steward's office. Seats in the Lecture rooms are assigned by selection to students in the order of registration on the Treasurer's books, and each student is expected to occupy during the session such seat as may be assigned to him. In the clinical lectures the graduating class, by courtesy, are allowed the privilege of the seats nearest the operating table and lecture desk.

Letters of inquiry may be addressed to the "Dean of the Faculty of the Department of Medicine and Surgery," Ann Arbor, Michigan.

By comparing the present provisions with those of former years it will be seen that very great advancements have been made in the means offered for a complete and thorough medical education. The plan of nine months' sessions and three years' graded course in medical schools in this country, inaugurated by Harvard College, has been followed by the venerable University of Pennsylvania in a graded course, but without extension of the length of the sessions; and it is a cause of congratulation that this extension of the course in the University of Michigan, long since recommended by the Faculty, and more recently by the Alumni of this College, and others of the medical profession of the State, has at length been accomplished. The great importance of this movement must be evident to all who appreciate the vast extension of medical science, which has occurred since medical schools were established among us with four months' terms, or who compare the short courses prevalent in this country with those so much longer in Europe. The great fault with many American medical students is a desire to rush speedily over their course of study and enter, though but partially prepared, into the responsible duties of active practice. It is found, however, by the increase in the size of our classes since the extension of the term of instruction has been effected, that there are already many, and it is hoped that the number will increase, who desire more thorough and extended preparation, and that since by the liberality of the State the means of securing this thorough training are put within their reach, still more who have talent, energy, perseverance and high aims will avail themselves of the increased advantages offered.

In the plan of the extended course provided, and which we are sure it will be for the interest of every medical student to take, the attempt has been made so to combine a successive or graded course of study with reviews by repetition of the more important lectures, as to obviate the serious objection of dismissing one part of a connected subject before its relations to other parts can be seen and appreciated, and to avoid also the confusion incident to the presentation of so many parts of the general subject to the mind of the student at the same time and at an early period of his studies.

This extended course affords time for the teaching and study of subjects not generally, or very imperfectly, taught in our public schools—such as Ophthalmology, Dermatology, Diseases of the Mind, Preventive Medicine, Medical Jurisprudence, Pathological Anatomy, etc., and especially will it give more time for thorough work in the Laboratories now provided. Though not fully supplying the defects of preliminary education, this longer course, accompanied with repeated examinations and written exercises, will supplement the deficiencies of earlier training, and of itself will be a most efficient means of mental discipline, and of literary as well as scientific culture.

This plan which has been adopted with the view of avoiding the impracticable and of securing real and decided advancement, is presented in the hope that it will commend itself to the judgment and support of the profession. Upon the members of the profession who have encouraged such advancements by repeated recommendations, the schools making such improvements should be able to depend for more substantial encouragement than mere advice. Should physicians while professing a desire for reform, send the students whom they control to schools where diplomas are soonest and most easily obtained, the cause of advanced medical education must suffer. Upon their consistency and practical efforts for reform, the success of these experiments must depend.

Should students be ready to commence the study of medicine near the opening of the term in October, it is advised that they enter the college at once and remain during their three years of pupilage—the instruction in the graded course being adapted to beginners. Should it be convenient to commence medical studies at a period distant from the beginning of the college year, they should procure one of the text-books in Anatomy (Gray's), in Physiology, in Chemistry, and perhaps in General Pathology and in Materia Medica, and a *Medical Dictionary*. A study of such works, even without a preceptor, will afford some general acquaintance with these fundamental subjects, and will, at least, give a knowledge of *terms* which will be of service in more readily comprehending the lectures.

Department of Law.

I. DEPARTMENT OF LAW.

In this Department it has been the constant endeavor of the Faculty to make the instruction imparted and the advantages afforded equal to any attainable elsewhere in the country; and in this they believe they have been entirely successful. No effort will be spared to make the Department deserve in the future a prosperity like that it has hitherto enjoyed. A spacious building is devoted to its accommodation, with ample debating and society rooms, and in every respect the conveniences of the Department are exceptionally good.

II. TERMS OF ADMISSION.

The requisites for admission are, that the candidate shall be not less than eighteen years of age, and be furnished with a certificate giving satisfactory evidence of good moral character. Some previous reading in the law is desirable, but it is not absolutely required, though it is expected that all students will be well grounded in at least a good English education, and capable of making use of the English language with accuracy and propriety. The course of instruction for the two terms has been carefully arranged, with a view to enable students to enter profitably at any stage of their studies, and it is not important which course of lectures is first taken.

III. COURSE OF INSTRUCTION.

The design of the Department is to give instruction that shall fit students for practice in any part of the country. The course will embrace the several branches of Constitutional, International, Maritime, Commercial and Criminal Law, Medical Jurisprudence, and the Jurisprudence of the United States; and will include such instruction in Common Law and Equity Pleading, Evidence and Practice as will lay a substantial foundation for practice in all departments of law.

The course will be continued through a period of two years, with one term in each year, commencing on the first day of October, and continuing until the Law Commencement in the last week of March ensuing. Ten lectures with accompanying examinations will be delivered each week during the term. For one year they embrace the following subjects:

The Origin and History of Equity Jurisprudence.

The General Heads of Equity Procedure and Nature and Forms of Equitable Remedies.

Criminal Law, and Medical Questions bearing on it;

The Laws of Evidence, and their application to Legal Proceeding;

Contracts;

Title to personal Property by Gift, Inheritance, Sale, Mortgage, Assignment, and by Operation of Law;

Bills of Exchange and Promissory Notes, and Commercial Law generally;

Estates in Real Property; Easements;

Title to Real Property; Domestic Relations.

For the year following the following subjects:

Some Special Heads of Evidence, and Equity Jurisprudence;

Equity Pleadings and Practice; Jurisprudence of the United States;

Shipping and Admiralty; Bailments;

Agency; the Law of Corporations; Common Law Pleading and Practice; Constitutional Law; Partnership; Uses and Trust; Wills, their Execution, Revocation, and Construction.

The Administration and Distribution of Estates of Deceased Persons.

Moot Courts are held from time to time during the term, for the argument of cases previously given out by the Professors by students designated to discuss them. They will be presided over by the Professor lecturing for the day, who, at the conclusion will review the arguments and give his decision upon the points involved. Club Courts will also be organized among the students, to be arranged and conducted by themselves, with such assistance from the members of the Faculty as may be desired. These Courts, thus far, have been found alike interesting and useful to those who have participated in them.

IV. LIBRARY.

A well selected and very useful Law Library is open for consultation by students at all reasonable hours. The rooms of the Professors are near the Library, and they will be ready at all times to furnish to students aid in their studies and investigations. The General Library of the University is also at all times open to the students of this Department.

V. DEGREES.

The degree of Bachelor of Laws will be conferred upon such students as shall pursue the full course of two years in this Department, and pass an approved examination. It will also be conferred upon those who, having attended another Law School for a period equal to one year of our course, or practiced law for one term under a license from the highest court of general jurisdiction in any State, shall also pursue one year's course in this Department, and pass a like examination. In Michigan, the degree entitles the resident graduate to an immediate license to practice in all the courts of the State.

Candidates for degrees will be required to prepare and deposit with the Faculty, at least one month before graduation, a dissertation not less than forty folios in length, upon some legal subject selected by themselves. These theses will be filed and preserved in the Library.

VI. BOOKS.

While several copies of each of the leading text-books will be found in the Library, it is exceedingly desirable that students should supply themselves with such as they may need at their rooms. The Professors will lend them aid in making proper selections, and no loss will be incurred, as the books will be found essential in subsequent practice. Students will find that it will greatly facilitate their studies to have them at hand at all times.

VII. FEES AND EXPENSES.

The fees,* which must be paid in advance, are as follows:

MATRICULATION FEE.—Residents of Michigan, $10; non-residents, $25.

ANNUAL DUES.—Residents of Michigan, $20; non-residents, $25.

GRADUATION FEE.—For all alike, $10.

The admission fee is paid but once, and entitles the student to the privileges of permanent membership in any Department of the University. The annual tax is paid the first year, and every year thereafter. For other details of expenses, see pp. 21-22.

VIII. GENERAL REMARKS.

The Faculty are frequently applied to by letter for advice upon the question of whether it is desirable to enter upon the study of law, and acquire some general knowledge of the principles, before admission to the Department. It is somewhat difficult to lay down general rules that can be advantageously applied in all cases, but the Faculty are of opinion that for the first year at least, more positive benefit is received from the lectures, and more positive advancement in the law made, by students who have read before coming, at least the Commentaries of Blackstone, than by those who are beginners here. But the Faculty are aware of the difficulty experienced by the student in giving proper direction to his reading and investigation at the beginning; and they do not therefore make it a condition of admission that there shall be any prior reading in law whatever. The want of such prior reading will, doubtless, in many cases, be fully compensated in the aid the beginner may receive here in the outset. It is not often that the student receives the needed assistance except in law schools. The active practitioner engrossed with the cares of business, cannot—or at least, as proved by experience, does not—furnish the students who place themselves in his charge, the attention and assistance essential to give a correct direction to their reading, and to teach them to apply it usefully and aptly in their subsequent professional life. The reading of a student in a law office is practically the study of the law by himself, and without assistance; and he neither acquires that familiarity with books, and that facility of reference which it will be the aim of this department to assist in acquiring, nor learns anything of the practical application of legal principles, beyond what he may pick up from observation of the practice of his preceptor. The effort here will be to make not *theoretical* merely, but *practical* lawyers; not to teach principles merely, but how to apply them. To this end, the Moot Court will be made the forum for the discussion of such practical questions as must frequently arise in a professional career, at the bar; and the attention of the Faculty will be directed not less to the application of the points discussed to actual cases, than to the elucidation of the legal questions. An opportunity will be afforded all the senior students to participate in this court, and they will at all times have such assistance in their Club Courts as they find themselves in need of.

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* No portion of the fees can be refunded to students who leave the University during the academic year, except by order of the Board of Regents.

While thus endeavoring to impart legal knowledge, the fact will not be lost sight of, that a high moral standard is a most important requisite to a successful and honorable career; and no pains will be spared in impressing this fact upon students, and in inculcating a high tone of professional ethics and action.

Those who desire any further information concerning the Law Department, may make their inquiries of Hon. T. M. COOLEY, Dean of the Law Faculty.

School of Pharmacy.

It is the design of this department to qualify its graduates to become practical pharmacists, general analysts, and chemical manufacturers, and to give them the training of systematic work in exact science. Class instruction is made to coöperate with laboratory practice in all the topics of the course. The class-work comprises both recitations and lectures—given in progressive order and not repeated to the same students. The required work in the chemical and microscopical laboratories employs three to four hours daily through the two collegiate years, embracing three semesters of analytical chemistry, one semester of micro-botany, and one semester of pharmaceutical chemistry.

REQUIREMENTS FOR ADMISSION.

Applicants are admitted upon diplomas of graduation from graded High Schools, and upon certificates of good standing in higher educational institutions. Other applicants are admitted upon examination in the following branches:

1. In the correct writing of English.

2. In Arithmetic, and Algebra through simple equations.

3. In Latin, amounting to one year's study. Jones's First Latin Book, or Harkness's Latin Reader, or an equal amount in other text-books.

4. Or, instead of Latin, German to the extent of a year's study.

This examination will begin on the 24th day of September, 1880, at 9 A. M.

STUDIES REQUIRED IN THE FIRST YEAR.

1. *Pharmacy.*—Rudiments of Chemical Philosophy; Metrology; Chemical Problems; Study of Pharmacopœias; Pharmaceutical Ope-

rations; Heat and its uses. Lectures and Recitations, three times a week, through the first semester. Examination at the close of the course.

2. *Chemical Physics and Inorganic Chemistry.*—Illustrated lectures three and four times a week, with the use of Miller's Chemical Physics and Attfield's, or Tidy's Chemistry. Remsen's Theoretical Chemistry is advised as additional aid. The examination is held at the close of the first year.

3. *Botany.*—Recitations with Gray's Lessons and practical studies with fresh plants (use of Gray's Manual) daily from the spring recess to the week before the June Commencement. Special attention is given to indigenous medicinal plants.

4. *Qualitative Analysis.*—Drills in Chemical Notation preparatory to Laboratory work begin September 25. Laboratory work begins as early in October as the class is prepared, and continues daily, with daily recitations, until the completion of the course about the 10th of March. The work consists of (1) the study of the bases and acids, practicing with *known material*, and using problems in chemical synthesis; (2) after an intermediate examination, and about the first of December, the *analysis of unknown material* is entered upon by each student independently, with lectures on Analytical Chemistry including a study of oxidations and reductions, in the class-room. Text-books, Douglas and Prescott's Qualitative Analysis, and, for General Chemistry, Tidy, or Miller's Inorganic. Students must finish this study before entering upon quantitative analysis or pharmacopœial preparations.

5. *Quantitative Analysis.*—(1) Determinations of Densities; (2) Gravimetric Determinations; (3) Volumetric Determinations; (4) Gravimetric Separations. Lectures in quantitative analysis are given three times a week, requiring a study of all the chief separations as well as those performed in the Laboratory. Text-books, Classen's Quantitative Analysis, with reference to Fresenius and Sutton.

STUDIES REQUIRED IN THE SECOND YEAR.

6. *Pharmacology and Micro-Botany.*-Exercises daily through the first semester, as follows: Examination of fresh plants continued for the first six or eight weeks. Then lectures or exercises on structural botany, with reference to the identification of drugs of vegetable origin and the detection of adulterations in foods, condiments and medicines. The lectures alternate with work in the Microscopical Laboratory, embracing a systematic course in examination of a series of commercial articles, with use of Stille and Maisch's Dispensatory. Examination at the close of the first semester.

7. *Crystallography.*—Twelve to fifteen lectures on systematic crystallography with exercises in identifying crystals.

8. *Materia Medica.*—Recitations on materia medica proper, and prescriptions, three times a week for four or five months; and lectures on materia medica and therapeutics. A collection of crude drugs and pharmacopœial preparations in the chemical laboratory is used by the class in study for the recitations. Text-book, Farquarson's Materia Medica. Examination, at the close of the year.

9. *Pharmacy.*—First, of *Inorganic* materials and the technical history of chemical wares, by dictation of notes, and recitations from works of reference and from laboratory work, until the Christmas vacation. Second, of *Organic* chemistry and materials, dictation of notes, and recitations from Proximate Organic Analysis, until the week before the June Commencement. For the first six months of the term, three times a week; for the last three months of the term, five times a week.

10. *Organic Analysis.*—(2) Verification of the reactions of carbon compounds in a series of known mixtures; (2) Qualitative Analysis of a series of organic mixtures; (3) Quantitative estimation of organic drugs. Text-book, Prescott's Proximate Organic Analysis.

11. *Toxicology.*—Analysis of food material or tissue material in assumed cases of poisoning and in cases instituted with animals,—including the chief inorganic and organic poisons. Lectures are given. Reference is made to the works of Otto, Wormley, Reese, Taylor, Woodman and Tidy.

12. *Analysis of Urine.*—Normal and abnormal, by qualitative, volumetric and microscopical methods. Text-book, Vaughan. Reference to the works of Hassall, Beal, Thudicum, Burdon-Sanderson. The examination is held on completion of a course of lectures on this subject.

13. *Pharmacopœial Preparations.*—Exercises in each class, U. S. Pharmacopœia; in some of the more elaborate chemical productions; and in the minor performances of extemporaneous pharmacy. Use of the U. S. Pharmacopœia with reference to the Dispensatory, and other works.

14. *The Thesis* for the degree of Pharmaceutical Chemist is required to embody the results of research by the student under direction of the Professor in charge of the subject chosen, which must be accepted by the Faculty as early as the first of March. The investigation may consist in the determination of constants of nature, the correction of chemical formulæ and reactions, the chemical and microbotanical analysis of plants, the trial of methods of analysis or manufacture, the exposure of adulterations and concealed constituents, the collection of a cabinet, the compilation of an index, or personal

research in any branch of pharmaceutical chemistry. A careful comparison of authorities must first be made and references given.

The required *text-books* are named in connection with the work for which they are used, as are also some of the *works of reference* most frequently used. It is very desirable that the student in the second year should have Stille and Maisch's Dispensatory. Attfield's Chemistry is convenient through the course. Students are not required to provide themselves with the works of reference, many of which are provided at the laboratories. Storer's Dictionary of Solubilities and Watt's Dictionary of Chemistry should be very frequently consulted. The following reference works are among those most employed: Roscoe and Schorlemmer's Chemistry; Schorlemmer's Organic Chemistry; Gmelin's Hand-book of Chemistry; Bentley and Trimen's Medical Plants; Wittstein's Chemical Analysis of Plants; Husemann's Pflanzenstoffe; Hoffman's Medical Chemistry; Hassall's Adulterations; Prescott's Examination of Alcoholic Liquors; Vogel's Nahrungs und Genusmittel; Hager's Untersuchungen and Pharmaceutische Praxis; Heppe's Chemischen Reactionen; Wagner's Technology; Planchon's La Determination des Drogues Végétales; Flückiger and Hanbury's Pharmacographia; Flückiger's Pharmaceutical Chemistry; Dragendorff's Works. The current numbers and complete sets of the leading foreign and American journals are kept accessible to the student.

THE COLLEGE YEAR in this school commences September 24th, for first year students; and October first for second year students, and closes at the June Commencement. Graduates receive the Degree of Pharmaceutical Chemist.

Concerning Expenses of Chemical Laboratory work, see page 60. The average cost of material in the Chemical Laboratory has been about one dollar and twenty cents per week for each student in Pharmacy. For details of University fees and of other expenses see pp. 21–22.

The order of exercises is given on the following page.

ORDER OF EXERCISES.

FIRST YEAR—FIRST SEMESTER.

Class Work.

HOURS.

8½ to 9½ Analytical Chemistry (4)*—daily.
9½ to 10½ Pharmacy (3)—three times a week.

Laboratory Work.

1 to 5 Qualitative Analysis (4)—daily.

SECOND SEMESTER.

Class Work.

9½ to 10½ Quantitative Analysis (6)—three times a week.
10½ to 11½ Pharmacy (1)—three times a week—until recess.
Botany (3)—five times a week—from the recess to the close.
11½ to 12½ General Chemistry, three times a week—after recess.

Laboratory Work.

1½ to 5½ Qualitative Analysis (4) (concluded) daily.
Quantitative Analysis (5) daily, or Pharmacy Preparations (13).

SECOND YEAR—FIRST SEMESTER.

Class Work.

11½ to 12½ Pharmacology and Micro-Botany (6), three times a week.
9½ to 10½ Pharmacy (9)—three times a week.
Crystallography (7)—twelve or fifteen lectures.
10½ to 11½ Quantitative Analysis (6)—three times a week—to holidays.
5 to 6 Materia Medica Recitation and Lectures (8)—three times a week.

Laboratory Work.

9½ to 11½ Micro-Botany (6)—three times a week.
1 to 5 Toxicology (11) Anal. Urine (12).
Pharmacopœial Preparations (13) or Quantitative (5).

SECOND SEMESTER.

Class Work.

9½ to 10½ Pharmacy (9) three times a week—to recess.
daily, after recess.

Laboratory Work.

1½ to 5½ Organic Analysis (10) daily.
Original Work (13)

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* The figures in parentheses refer to the numbering of the courses given in the preceding pages.

THE
Homœopathic Medical College.

I. ENLARGED AND EXTENDED INSTRUCTION.

The provision of the Legislature has enabled the Board of Regents to meet the growing demands for a more advanced medical education by extending the course of teaching from six to nine months in each year, and by enlarging the curriculum. Henceforth the session includes the entire University year, extending from October first to July first.

In addition to this extension of the term, a graded course to include three years' study will be provided. The *first* year of this course will include Anatomy, Histology, Physiology, Chemistry and Materia Medica, with the necessary practical work in the Chemical, Anatomical and Physiological Laboratories. This year's Materia Medica work will be devoted to teaching the source, nature, origin and method of preparing remedies, with their physiological action, and a general survey of their pathogenesis.

In the *second* year the above studies will be reviewed, and the student will take up Pathology, Pathological Anatomy, Chemistry, in its application to Physiology and Pathology, Theory and Practice of Medicine, Principles of Surgery and Minor Surgery, and Hygiene or Preventive Medicine. The Materia Medica work of this year will consist of special analyses and syntheses of drug-provings. In addition the student will attend such didactic and clinical lectures on the Practical Branches as his progress shall render advisable.

At the end of the *second* year, *final examinations* will be held in Anatomy, Histology, Chemistry and Preventive Medicine.

In the *third* year, Pathology and Pathological Anatomy will be reviewed, and the student will enter upon Ophthalmology, Obstetrics, Diseases of Women and Children, Surgery, and the Theory and Practice of Medicine, with practical instruction in Diagnosis and Treatment.

In this course Therapeutics and Experimental Pathogenesy will be taught—the latter with all the aids of the Chemical and Physiological Laboratories. Every opportunity will be given to those desiring to make original investigations in drug action.

No student shall be recommended for the degree of Doctor of Medicine who has not passed a thorough and satisfactory examination on all the subjects taught in the extended course, and who has not been in regular attendance upon Medical Lectures in this or some other respectable school of Medicine for at least two full courses, the last of which must have been in this College. *After the session of* 1879–80 no student shall be permitted to graduate except at the June Commencement.

The final examination of all future matriculates will be conducted, in part at least, in writing; and during the last session each candidate for graduation will be required to submit to written examinations, and may be called upon to write upon some theme assigned by the instructor or selected by the student: the essay, if required, to be defended before the class. In consequence of these exercises a final thesis will not be required.

Properly qualified students may enter the College at any time, and pursue such of the studies therein taught as they may select, and they shall receive special certificates for the time spent and the study or studies pursued. By action of the Regents special rates have been established for the benefit of such students. For practical laboratory work this arrangement affords an opportunity of which it is hoped many will be glad to avail themselves, and the advantages are second to none in America.

The Board of Regents have enacted that henceforth all examinations of matriculates of this College for its degree shall be made by its Faculty and its Board of Examiners.

II. THE LECTURE COURSE.

In accordance with these arrangements the sixth annual course of lectures will commence on Friday, October 1st, 1880, and continue until the last Wednesday of June, 1881, with a recess during the holidays.

Four lectures will be delivered daily; and during the course frequent examinations will take place upon the subjects presented in the lectures. Clinics are held in the college every Wednesday and Saturday, for both medical and surgical cases, at which time examinations are made, prescriptions given, and surgical operations performed, gratuitously to patients, in the presence of the class.

III. TERMS OF ADMISSION.

Every candidate for admission to this college must be eighteen years of age, and must present to the Dean satisfactory evidence of a good moral character. Unless already a matriculate of the University or a graduate or advanced member of some respectable college, academy or high school, or unless holding a certificate from some public school board as being a properly qualified teacher, or unless having a certificate based upon an examination of some legally authorized medical society as being properly qualified to engage in the study of medicine, every candidate shall be examined as to his previous education and his fitness to enter upon and appreciate the technical study of medicine. The diploma, certificate of graduation or of advanced membership, or of teachership or other evidences of qualification from such institutions must be presented to the Dean of the Faculty by the candidate, in order to secure exemption from the examination, which will be in writing, and will cover the ordinary branches of an English education. This examination is not yet so exacting in its demands as we hope soon to be able to make it, but it is intended to test the student's acquaintance with the fundamental branches of an English education, and his general intelligence and capacity to appreciate and profit by professional instruction.

Examinations will be held at 2 P. M. on Wednesday and Thursday, September 29 and 30, 1880. Candidates are required to present themselves on one of those days, as they are expected to be in attendance on the first day of the term, at which time the regular course of instruction will commence. To provide for cases in which it is absolutely impossible for the candidates to be present at this time, supplementary examinations will be held at such times as may be determined upon by the Faculty, but no excuse, except of an urgent character, will be accepted for failure to appear at the first examination. Certificates of attendance are given for the actual period of attendance only.

Before admission to examination every student is required to present to the Dean of the Faculty the Treasurer's receipt for the payment of the matriculation fees and annual dues. It will therefore be necessary for the candidates to apply first to the Steward at his office in the University Hall, register their names as students in the Homœopathic Medical College, and then pay their fees to the Treasurer. In case of rejection, the money paid preliminary to examination will be refunded by the Treasurer.

IV. ADMISSION OF WOMEN.

Recognizing the equality of rights of both sexes to the highest educational advantages, the Board of Regents, a few years since, made provision for the medical education of women, and they are now admitted to this College, as to all other Departments of the University, on the same conditions that are required of men. It is proper to state, however, in answer to numerous inquiries which are made on this point, that the course of instruction for women, though equal in all respects to that provided for the men, is for the most part, given separately, the two classes being together in the lecture room, however, in the department of General Chemistry and in clinics. Ample provision has been made for the women's classes in the way of lecture rooms, dissecting rooms, etc.

V. CONDITIONS OF GRADUATION.

Those candidates preparing to graduate at the close of their second course of lectures, must announce their intention at the beginning of that course, in order to receive those repeated examinations necessary to attest their qualifications.

Those proposing to receive the full three years' graded course before presenting themselves for graduation, must announce their intention to the Dean at the time of their matriculation, or whenever they have thus determined, so that they may be classified, and receive proper directions respecting attendance and exercises, and have proper places assigned them at the various lectures they may attend, and that records may be kept of their course, attendance and progress. They will from time to time receive certificates of attendance, and of their standing on the subjects in which they have been fully examined.

To be admitted to the degree of Doctor of Medicine, all students must present evidence of the possession of a good moral character, of being twenty-one years of age, of having been engaged in the study of Practical Anatomy and of Practical Chemistry, and of having pursued the study of medicine for the period of three years, including the time spent in attendance upon lectures,—not in addition to this time,—and must have attended three full courses of lectures on the different branches of medical science, the last of which must have been in this college; but to encourage a higher grade of preliminary acquirements, and in recognition of the value to a candidate of an extended course of scientific and literary studies, an allowance of six months from the term of medical studies is made in favor of graduates of the College of Arts and Sciences in this University, and of other respectable literary colleges; and also in acknowledgement of the amount of medical knowledge obtained in a full course of Pharmaceutical study, an allowance of twelve months is made for graduates in the Department of Pharmacy in this University.

VI. FACILITIES FOR INSTRUCTION.

Students in this college will receive instruction in Materia Medica, Therapeutics, and Experimental Pathogenesy from Prof. Jones; in Theory and Practice, and Clinical Medicine from Prof. Wilson; in Surgery, from Prof. Franklin. Obstetrical and Gynæcological Therapeutics will be taught jointly by Professors Wilson and Franklin for the present.

For all other studies the students will attend the lectures in the Department of Medicine and Surgery, and the lectures and demonstrations in the Chemical and Physiological Laboratories. While in attendance upon such lectures and demonstrations they shall be entitled to all the privileges accorded to students in said Department, and shall conform to all the requirements of said Department, so far as they apply to the branches which they pursue.

Liberal provision is made by the Board of Regents for illustrating the various branches of instruction by plates, preparations, specimens and apparatus. The department of chemistry and chemical physics is probably unsurpassed, if indeed it is equalled in the extent and thoroughness of its equipments, by that of any medical college in the country. The museums, containing several thousands specimens, comprise a valuable collection of bones, amply illustrating both physiological and pathological conditions of all ages, and showing the processes of dentition, of growth, and of decay in the osseous system, dried preparations normal and abnormal, of the different tissues of the body, including muscles, blood vessels, nerves, etc.; models and casts illustrating skin diseases, tumors, and pathological changes in the various organs. In the sections devoted to comparative embryology and craniology, and in human embryology, and the diseases of women, the collections are especially interesting. The specimens of monstrosities, both single and double, of man and the lower animals, are very numerous and instructive.

Besides these aids in study, the students in medicine are allowed free access to the general botanical, zöological and geological cabinets of the University, which are estimated to contain 255,000 specimens. The scientific and philosophical lectures collateral to medicine, which are given in the Literary Department, are also open to our students. The General Library contains about 28,000 volumes, of which some 2,000 are medical works. A complete catalogue of the library, arranged both by the names of authors and by subjects, is accessible to all students. The leading medical periodicals of this country and of Europe are taken and kept on file in the library.

Arrangements have been made by which ample supply of material for the purposes of practical anatomy has been secured, and special attention will be devoted to rendering this important study as advantageous as possible to the student. Experience has shown that *material* can be purchased here abundantly and at reasonable rates.

The Chemical Laboratory of the University provides thorough instruction and suitable appliances for the practical study of all branches of medical chemistry. Two branches—carefully adapted to the common needs of the medical profession—are *required* for medical graduation, namely: (1) Qualitative chemistry, devoted to the study of chemical changes and incompatibilities; and (2) Analysis of Urine, applied to clinical uses and physiological study. In each of these branches stucents are taken, in class-sections of limited number, for daily drill in the class-room, with daily practice in the laboratory work, each class is prepared in chemical notation by sufficient daily drill; and at the close of the work in each branch, the classes are held to an examination upon the work required. The classes commence at such several times of the college-year as will be announced at the opening of the term.

By action of the Faculty two extended *optional courses* have been established, one in Physiological and Pathological Chemistry, and another in Toxicology. The *first* will embrace analysis of the Blood, Urine, Gastric Juice, Brain, Bile, Bone, Muscles, and other fluids and solids of the body. The *second* will embrace courses of Qualitative and Quantitative Analysis, and the special examination of foods and of the tissues and fluids of poisoned animals, for the detection of the various mineral and organic poisons. Each of these special courses, which are not required for graduation, employ about one collegiate year of Laboratory work. Students willing to devote time to *original work* in physiological chemistry or other branches, after due preparation, are given the fullest encouragement and coöperation. Also, courses in Quantitative Analysis, and in Pharmaceutical Preparations, are open to students of medicine who may desire such special training.

MUSEUM.

Arrangements have been entered upon to procure a museum for this college, and some interesting specimens have already been presented. Practitioners and friends of the college are earnestly requested to send to the museum pathological and other interesting specimens, which will be acknowledged and the name of the donor will be printed thereon.

By an act of the Legislature of Michigan, a liberal appropriation for the equipment and conducting of a Physiological Laboratory has been made; and microscopes, a stereopticon, sphygmograph, and numerous other instruments for extended practical work have been procured, and are in daily use. By the coöperation of the Professors of Anatomy, Physiology, and Pathology, and under proper efficient direction, and with capable assistance, the students in the Homœopathic College will have opportunities of practical instruction in Experimental Physiology and Histology, both physiological and pathological; and this, supplemented by instruction in Pathological Anatomy and Medical Chemistry, is designed to afford facilities to students for minute and specific scientific study and research exceedingly rare in this country, the want of which is deeply felt by all advanced medical practitioners.

While all students in the Department are admitted to this Laboratory, the Faculty would suggest to those who desire to enter it, that it would be of great assistance to them to make themselves familiar before admission to the medical school with the general facts of Biology and of Physiology, by such dissections and experiments as are described in the little manuals of Huxley and Martin, and of Foster and Langley. Instruction in these topics is given in the Department of Literature, Science and the Arts in the University.

Recognizing the importance of combining clinical with didactic instruction, College Clinics have for years past been conducted on Wednesdays and Saturdays during the session, for Medical, Surgical, Ophthalmic and Aural patients. These are examined, prescribed for, and when necessary, operated upon before the class; and large numbers, especially of chronic cases, from this and neighboring States, have availed themselves of these privileges.

On the recommendation of the Board of Regents, the Legislature at their last session, with their usual liberality made an ample appropriation for the establishment of a spacious Amphitheatre and Hospital upon the University grounds, for the exclusive use of the Homœopathic College. The Amphitheatre, which is connected with the Hospital wards, has a seating capacity sufficient for over two hundred students, and is constructed with especial reference to the advantages which students are to derive from clinical instruction. The Hospital is now in readiness for the reception of patients, and is in immediate charge of a competent Resident Surgeon and Physician and an experienced matron. The whole is placed under the direction of the Faculty of the College, who will give regular attendance to the patients of their respective departments and careful clinical instruction in the wards to the senior students of the College.

The Hospital will be kept open for patients applying from this and other States during the whole year, the only restriction being that no contagious diseases are admitted.

The expense to patients will be only for their board and for unusual appliance the, services of the Faculty being rendered gratuitously.

Under the present arrangement, and with ample opportunity for Homœopathic treatment patients will be much better accommodated, and clinical instruction is rendered more systematic and efficient than has hitherto been possible.

VII. FEES AND EXPENSES.

The fees,* which must be paid in advance, are as follows:

MATRICULATION FEE.—Residents of Michigan, $10; non-residents, $25.

ANNUAL DUES.—Residents of Michigan, $20; non-residents, $25.

GRADUATION FEE.—For all alike, $10.

Graduates of any respectable college are admitted to all the privileges of the matriculate, *save that of obtaining a degree*, on the payment of the annual dues, as residents or non-residents. Such students after passing examination, may receive a special certificate, signed by the President of the University, for each study pursued.

The *admissson fee is paid but once*, and entitles the student to the privileges of permanent membership in any Department of the University. The annual fee is paid the first year, and every year thereafter.

There are neither dormitories nor commons connected with the University. Students obtain board and lodging in private families for from three to five dollars per week. Clubs are also formed in which the cost of good board is from one dollar and a half to two dollars and a half per week. Room rent varies from seventy-five cents to two dollars per week for each student.

It is proper to say, in answer to numerous inquiries, that the University does not undertake to furnish manual labor to students; yet a considerable number of students find in the city opportunities for remunerative employment.

It is also proper to state that, in no seat of a prominent institution of learning in this country, are the necessary expenses of living and procuring supplies of every kind less than at Ann Arbor. Books, instruments, and all other appliances for the work of students are kept constantly on hand, and are afforded at as low prices as elsewhere.

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* No portion of the fees can be refunded to students who leave the University during the academic year, except by order of the Board of Regents.

VIII. TEXT AND REFERENCE BOOKS.

Any of the following text-books in each department will answer the necessities of the student; and wherever a preference exists, it is given to those first in order on the list.

ANATOMY.—Gray, Wilson, Leidy, Peaslee, Stricker.

PHYSIOLOGY.—Küss, Kirke, Dalton, Marshall. *For Reference.*—Flint, Carpenter, Todd and Bowman, Sanderson's Handbook for the Physiological Laboratory.

CHEMISTRY.—*In General Chemistry.*—Miller's Chemical Physics, Miller's Inorganic Chemistry, or Eliot and Storer's Manual of Chemistry. *For Laboratory.*—Douglas and Prescott's Analysis, Vaughan's Physiological Chemistry, Wormley on Poisons.

PATHOLOGY AND PATHOLOGICAL ANATOMY.—Wagner, Green, Rindfleisch, Billroth, Paget, Williams's Principles. *For Reference*—Rokitansky and Virchow.

MATERIA MEDICA AND THERAPEUTICS.—*Dunham, Lilienthal's Therapeutics.* Hughes's Pharmacodynamics; Herring's condensed Materia Medica; Hull's Jahr; New Remedies, 2d edition; Hahnemann's Organon, Materia Medica Pura, and Chronic Diseases; *Cowperthwaite,* Allen's Encyclopedia; Hartmann's Homœopathic Remedies. *For Reference*—H. C. Wood, Bartholow, Stillé, Phillips, Ringer; Christison, or Taylor on Poisons.

N. B.—Phillips and Ringer are especially recommended to such practitioners and graduates as contemplate studying Homœopathy.

EXPERIMENTAL PATHOGENESY. *Hahnemann's Organon,* Wesselhœft's Translation, Brunton's Investigation of the Action of Medicines, Part I. Ott's Action of Medicines. *Handbook for the Physiological Laboratory,* edited by J. Burdon-Sanderson, Manual of Chemical Physology. *Thudicum.*

OBSTETRICS.—*Guernsey, Richardson, Leadam,* Playfair, Meadows, Marsden, Byford, Schrœder, Cazeaux, Hodge. *Special Subjects*—Tanner on Pregnancy, Barnes on Obstetric Operations, Elliott's Obstetric Clinic, Barker on the Puerperal Diseases.

DISEASES OF WOMEN.—*Ludlam, Jahr,* Thomas, Byford, Hewitt West, Barnes, Hodge. *Special Subjects.*—Klob on Pathological Anatomy of the Female Sexual Organs; Peaselee on Ovariotomy; Sims on Uterine Surgery; Emmet on Vesico-Vaginal Fistula.

DISEASES OF CHILDREN.—*Hartmann, Duncan,* Tanner, Meigs, Pepper, Hillier. *Special Subjects.*—Eustace Smith on the Wasting Diseases of Infancy and Childhood; Combe on the Management of Infancy;

Routh on Infant Feeding; Holmes or Guersant on the Surgical Diseases of Children.

THEORY AND PRACTICE.—*Raue, Baehr, Ruddock*; *Hughes's Manual of Therapeutics; Homœopathic Therapeutics, by S. Lilienthal;* Niemeyer; Roberts; Aitkin; edited by Clymer. *For Reference.* — Reynold's; Ziemssen's Cyclopœdia.

SURGERY.—*Franklin, Helmuth, Gilchrist,* Erichsen, Hamilton, Druitt. *Special Subjects—Franklin on Spinal Dieases, etc.,* Hamilton on Fractures and Dislocations; Bumstead on Venereal Diseases; Sayre on Club Foot; Sir Henry Thompson on the Genito-Urinary Diseases and Surgery; F. N. Otis on Strictnre of the Male Urethra. *In Minor Surgery and Surgical Appliances.*—Wales, Sargent, C. Henri Leonard on Bandaging. *For Reference*—Gross's System of Surgery; Holmes's System of Surgery.

OPHTHALMOLOGY AND OTOLOGY.—*On the Eye—Angell, Allen and Norton, Hart,* Sœlberg Wells, Stellwag, Carter, Metz. *On the Ear*—Roosa or Toynbee with Hinton's Supplement.

PHYSIOLOGICAL CHEMISTRY.—Brunton, (Handbook for the Physiological Laboratory), Thudicum (Manual of Chemical Physiology). *For Reference*—Lehmann's Physiological Chemistry.

ELECTRO-THERAPEUTICS AND ELECTRO-SURGERY.—John Butler, M. D.

The student who is commanding a course of reading without an instructor, is recommended to devote the most of his time for the first year to the elementary branches, Anatomy, Physiology and Chemistry, both general and medical; then advancing to the other studies to select one of the first mentioned text-books in each department, passing to the "*special subjects*" only when near the completion of the course, or as he may desire for particular reasons to become more fully informed on such subjects.

IX. SPECIAL NOTICE.

In answer to many inquiries, it is thought desirable to state more explicity, that no previous study of Medicine is required for admission to the College. Any person of proper age and character, and having the requisite elementary English education is permitted to enter.

X. ASSIGNMENT OF SEATS.

Students on arriving in Ann Arbor can obtain the necessary information in regard to rooms, board, etc., by calling at the Steward's office. Seats in the Lecture rooms are assigned by selection to students in the order of registration on the Treasurer's books, and according to the class they are to enter; and each student is expected to occupy during the session such seat as may be assigned to him. In the clinical lectures the graduating class, by courtesy, are allowed the privilege of the seats nearest the operating table and lecture desk.

Letters of inquiry may be addressed to the "Dean of the Homœopathic Medical College," Ann Arbor, Michigan.

College of Dental Surgery.

I. ANNOUNCEMENT.

The fifth annual course of instruction in this College will commence on Friday, October 1, 1880, and continue till the last Wednesday of March, 1881. There will be a recess of about two weeks during the holidays.

The term of instruction in the Medical Department is nine months. The students of the Dental College, therefore, have an opportunity to pursue their studies till the last of June, and it is especially urged and expected that during this time the work in the Chemical and Physiological Laboratories will be taken up and completed.

There are from five to six lectures daily during the regular course; examinations are made upon the subjects presented.

The Dental students are required to attend all the lectures in the Medical College, except as hereinafter provided.

Seats are assigned in the order of matriculation, and the regular course of instruction begins promptly at the opening of the term. It is for the interest of all and especially of the students that they be in attendance at that time. Still they may enter at any time during the session, but two full courses will be required, in addition to such fractional attendance, for graduation.

II. QUALIFICATIONS FOR ADMISSION.

Every candidate for admission must be eighteen years of age; and is required to present to the Faculty satisfactory evidence of a good moral character. Unless already a matriculate of the University, or a graduate of some respectable college, academy or high school, every candidate shall be examined as to his previous education, and fitness for entering upon and appreciating the technical study of Medicine. The diploma or certificate of graduation from such institution must be presented to the Dean of the Faculty by the candidate in order to secure exemption from the examination, which will be in writing, and will embrace the ordinary branches of an English education.

Examinations will be held on Wednesday and Thursday, September 29 and 30, 1880. Candidates are required to be present on the morning of the 29th or the 30th, as they are expected to be in attendance on the first day of the term, at which time the regular course of instruction will commence. To provide for cases in which it is absolutely impossible for candidates to be present at this time, supplementary examinations will be held at such times as may be determined by the Faculty. Certificates of attendance are given for the actual period of attendance only.

Before admission to examination every student is required to present to the Dean of the Faculty the Treasurer's receipt for the payment of the matriculation fees and annual dues. It will therefore be necessary for the candidate to apply first to the Steward at his office in University Hall, register his name as a student in the Dental College, and pay his fees to the Treasurer. In case of rejection, the money paid preliminary to examination will be refunded by the Treasurer.

III. THE ADVANTAGES OF CONNECTION WITH THE UNIVERSITY.

The Department of Medicine and Surgery, long in successful operation, offers in full the facilities required for the satisfactory study of all branches common to General Medicine and this Specialty. These facilities may be concisely enumerated as follows:

CHEMISTRY.

Recognizing the important part chemical agents and processes play in the laboratory and operating room of the dentist and the marked influence they have in diseases of the teeth and associate parts, the students are required to attend the lectures on inorganic and organic chemistry, besides which they have the advantages of the Chemical Laboratory, for the practical study of all those agents or secretions that concern their future needs in the prevention and cure of disease.

This Laboratory is devoted exclusively to chemistry, and is furnished with all needed apparatus for any kind of research that may be required. A course in analysis of saliva is required, and analysis of urine is made optional to the student.

MATERIA MEDICA AND THERAPEUTICS.

Under this head will be brought in review all the remedial agents the dentist will need to use, with the fundamental principles which will guide their application in practice. The instruction in this branch will consist of the lectures in the Medical College, supplemented by a special course of about twenty lectures on the particular therapeutic agents used in Dental practice. This course will be given in the Dental College.

ANATOMY.

The groundwork of our science, the importance of which to the dental student cannot be over estimated, will be studied demonstratively and practically. Besides the full course on general anatomy, which the student will attend with the medical class, special instruction will be given in the anatomy and histology of all that appertains to the oral apparatus. Thereby the dental student can become thoroughly acquainted with the region of his future professional practice, and in this he must actively participate to make his knowledge of these parts complete.

PHYSIOLOGY AND HISTOLOGY.

These subjects are fully considered and illustrated in their various aspects.

The importance of histological knowledge for the full comprehension of physiology is so fully recognized as to render necessary the establishment of a Laboratory which is now equipped with twenty superior microscopes and all accessory apparatus and appliances required for the thorough prosecution of the work.

The principal structures and tissues of the animal body are studied here in detail and special attention is given to their pathology, including the minute study of the new formations.

A course in this Laboratory not only gives the student a knowledge of animal structures and tissues, but makes him familiar with the workings and uses of the microscope.

All candidates for graduation are required to take this course.

PATHOLOGY AND PRACTICE.

The instruction in Pathology and Practice of Medicine, always thorough and exhaustive in regular medical lectures, will furnish ample means for becoming acquainted not only with the principles but with the details of practice. In addition to this there will be given a special course in the Dental College on Oral Pathology, which will embrace all of the diseases common to the mouth and the contiguous parts; also the influence of disease in other parts upon these.

SURGERY.

A complete course in this branch both didactic and clinical, will fully meet the dentist's needs in the discussion and presentation of the surgical diseases, as well as the great underlying principles of surgical practice wherever applied. A course in Oral Surgery will also be given in the Dental College.

DISEASES OF WOMEN AND CHILDREN.

Knowing how seriously the conditions of maternity and the provisions therefor often disturb the system, the dental student will be profited by instruction given in the obstetrical and allied lectures.

The diseases of children, also, as affecting dentition, and as being affected by it, should receive special attention by the dental student. A special course on these subjects will also be given in the Dental College.

In short, the advantages which are offered by a fully equipped medical college are of the first importance to the student of dental science, and attendance upon at least one entire course of medical lectures may properly be regarded as the true foundation for the subsequent study of a speciality.

IV. PRINCIPLES AND PRACTICE OF OPERATIVE DENTISTRY.

In this department will be presented the principles involved in the treatment of and operations upon the natural teeth and adjacent parts, for their preservation and restoration to health when diseased. This will embrace not only attention to the various affections of the teeth and contiguous parts, but the character and application of the special remedial agents, and the various approved methods of operating in all the details of condition, materials, instruments and appliances.

The student will be required to make his attainments thorough in all these particulars, in order that he may not be at a loss for a guide in his treatment and manipulation.

V. CLINICAL.

In this department is given the most thorough practical instruction in the operative details, and in the preparation of the instruments and appliances used.

The rooms are ample and well arranged, and fully supplied with all the requisite facilities, such as chairs, engines, etc. All valuable appliances will be made available, and instruction in their use given.

Every member of the Senior class, at least, will be required to spend a part of each day so far as possible in the clinic room.

The opportunity and facilities for clinical instruction and experience are all that could be desired. Application for treatment and operations have been far in excess of the requirements of the class. A very important consideration in this matter is, that nearly all of those applying for service are persons who appreciate the value of their teeth, and have been accustomed to receive the attention of skillful operators; in this fact is found a very desirable stimulus to the student.

VI. PROSTHETIC DENTISTRY.

The instruction in this department will embrace everything that will enable the dentist to meet successfully the requirements in supplying substitutes for lost dental organs.

Special reference will be had to the principles involved in the restoration of the natural functions of the teeth, viz.: mastication, enunciation and expression of features, keeping in view always, the health and future usefulness of the living parts. Only practical and valuable modes will be taught, and no time will be wasted upon worthless and obsolete styles.

Those who have Laboratory tools and appliances should bring them; those who have not, are advised to defer purchasing till they arrive at the college, as they will then have the aid of the teachers in making proper selections. Ample supplies will be at hand.

Each student will be required to procure and carefully keep the tools and appliances necessary for his own use, a list of which will be furnished him at the time.

Particular attention will be given to the manipulation and management of the precious metals with reference to their use for dental purposes.

VII. COURSE OF STUDY.

In the arrangement of the course of study it is the aim to make it such as will meet the requirements of the students and the expectation of the dental profession, and secure the greatest benefit to the public.

It is generally conceded that graded and progressive work promises the best results in education.

The curriculum prepared for this course embraces a range of subjects, the mastery of which cannot, without great difficulty, and at least some superficial work, be accomplished in less than three terms of six months each; therefore, to meet the necessity involved, the following schedule of subjects, embracing a three years' course, is presented and strongly recommended:

First Year.—Anatomy, Physiology, Dissections, General Chemistry, Prosthetic Dentistry, Physiological Laboratory,—*Histology.*

Second Year.—Review of First Year Studies, Anatomy, Physiology, General Chemistry, Practical Dentistry, Prosthetic Dentistry, Clinical Dentistry, Theory and Practice of Dentistry, Pathology, Materia Medica, Analytical Chemistry.

Third Year.—Theory and Practice of Dentistry, Clinical Dentistry, Pathology, Therapeutics, Special Surgery, *Oral;* Diseases of Women and Children.

At the middle of the second year the student may be admitted to an examination on Anatomy, Physiology, General Chemistry and Prosthetic Dentistry. This, if satisfactory, will be regarded as final. Prior to this he must make two or more satisfactory practical dentures, and also at this time present for deposit a denture that shall be acceptable to the Faculty. At the *end* of the second year, in addition to the above, an examination shall be had upon the principles of Pathology, Materia Medica, Histology and Analytical Chemistry. During, and at the end of the third year, examination will be had upon the remaining branches of the course, and an exhibition of such tests of skill and ability as the Faculty may ask will be required.

For those who may find it necessary to complete their course in two terms, the following schedule of studies has been prepared:

First Year.—Anatomy, Physiology, Dissections, *during Holidays;* General Chemistry, Analytical Chemistry, *at the end of the regular course;* Theory and Practice of Dentistry, Prosthetic Dentistry, Principles of Surgery, Materia Medica, Physiological Laboratory, *Histology, at the end of the regular course.*

Second Year.—Anatomy, Physiology, Pathology, Theory and Practice of Dentistry, Clinical Dentistry, Special Surgery, *Oral;* Therapeutics, Diseases of Women and Children.

At the end of the first year there will be an examination, preliminary, to entering the second course, upon Anatomy, Physiology and General Chemistry, and a final examination upon Analytical Chemistry, Prosthetic Dentistry and Histology.

At the middle of the second year a final examination will be had on Anatomy, Physiology, General Chemistry and Materia Medica; and upon the remaining subjects of the course at the end of the term.

VIII. AIDS TO INSTRUCTION.

Valuable additions have recently been made of imported preparations, illustrating Anatomy, Physiology, Pathology and Histology, including a series illustrating dentition from infancy to the completion of the process in the adult, and the normal changes through life to old age, and also illustrative of the dental and osseous tissues. Preparations, natural and artificial, greatly facilitate the study of the nervous and vascular systems as well. The design is to make every practicable appliance in this direction available.

It is proper to state that, in addition to the above, the Museum of the Medical College, so well supplied with all things necessary for the medical student, is rich in material to aid the dentist. The museum is constantly used in illustrating lectures and is always open to students. The University Museum also contains more than 250,000 scientific specimens, and is accessible to all who desire its advantages.

The University Library is open daily, offering its advantages with more than 2,000 volumes of medical literature to all who desire to use it, and a library of dental science, containing almost every known work on this speciality, is accessible to the students. Those who can command the time may also avail themselves of numerous lectures, or pursue elective studies, limited only by their capacity of appropriating what is abundantly offered.

IX. GRADUATION.

The candidate for graduation must be twenty-one years of age. He must furnish evidence of good moral character. He must have devoted three years to the study of his profession, and have made such attainments in all the branches of the course of study herein indicated as shall be satisfactory to the Faculty. He must attend two full courses of lectures in this

Dental College, and we recommend that he attend these consecutively. However, one course in any other Dental College having an equal or similar standard of requirements to this, will be accepted as an equivalent to one course here. But all applicants offering such an equivalent shall submit to a preliminary examination at the option of the Faculty. A graduate of the Department of Medicine and Surgery may enter the Dental College, and if found qualified, may graduate after one year has been devoted exclusively to the study of Dentistry. He must submit to the Faculty a thesis upon some subject of his course, or upon some practical case which he shall have brought to a successful termination by his own effort. He must present for inspection practical operations prepared by himself in the College, and give evidence of his skill and ability in treating those derangements which may be submitted to his care. He must sustain an examination satisfactory to the Faculty in all the branches taught.

X. TEXT-BOOKS.

Anatomy—Gray.
Physiology—Dalton.
Histology—Frey, Beale.
Pathology—Wagner.
Dental Pathology—Wedl.
Oral Surgery—Garretson.
Operative Dentistry—Taft.
Prosthetic Dentistry—Richardson.
Chemistry—Miller.
Therapeutics—Biddle.
Medical Dictionary—Dungleson.
Dental Dictionary—Harris.

XI. FEES AND EXPENSES.

The fees, which must be paid in advance, are as follows:

Residents of Michigan.—Matriculation fee, $10; annual dues, $20.

Non-Residents.—Matriculation, $25; annual dues, $25.

Graduation Fee.—For all alike, $10.

The admission fee is paid but once, and entitles the student to the privileges of permanent membership in any department of the University. The annual fee is paid the first year, and every year thereafter only while in attendance at the University.

A CATALOGUE

OF

FACULTIES AND STUDENTS

OF THE

UNIVERSITY, 1879-80;

PRECEDED BY

A LIST OF THE GRADUATES OF 1879.

H

DEGREES CONFERRED.

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William Warren Cole,
Charles Whatefield Coons,
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William E. Finley,
Channing Thomas Gage,
Edwin Peffers Hawley,
Philip Stanhope Houghton,
Paul Christen Jensen,
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Robert Fulton Mull,
Louis Philip Orth,
Daniel Edward Osborne,
Arthur Sheldon Parker,
Arthur Hubert Vandivert,
Allen Levi Walker,
Albert Christopher Wehrli, Ph. C.,
Frederick Lynn Wilson,
Lewis Newton Wood.

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CIVIL ENGINEER.

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Charles Carroll Brown,
Charles Sumner Henning,
Brayton Daniel King,
Irving Kane Pond,
Henry Goslee Prout,
(To be ranked in class of 1871.)
Orlando B. Wheeler, M. A., M. S.,

BACHELOR OF SCIENCE.

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Lorenzo John Locy,
James Wilfred McKinley,
Charlotte Maria Smith.

BACHELOR OF PHILOSOPHY.

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Erastus Albert Barnes,
Fred Somers Bell,
Michael Henry Brennan,
James Padelford Brown,
Oren Dunham,
Thomas Randolph Edwards,
Marion Sarah Gerls,
Maya Violet Lee,
Mark Norris,
Charles Gilbert Van Wert.

BACHELOR OF ARTS.

Henry Winfield Ashley,
Maria Lavinia Blood,
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William Foster Bryan,
James David Callahan,
Carina B. Campbell,
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Edmund Adolph Christian,

Frantz Hunt Coe,
Chauncey Ferris Cook,
Richard Gay de Puy,
Laura Donnan,
Fanny Clinton Farrand,
Charles Howard Greathouse,
William Albert Greeson,
Leroy Halsey,
Frank Dwight Haskell,
George Hempel,
William Cary Hill,
Edward Walter Jenney,
Fred Parker Jordan,
Frank Day Mead,
Newton McMillan,
Jesse Fonda Millspaugh,
Albert Samuel Pettit,
James Elijah Pilcher,
Cyrus Augustus Pomeroy,
John Ross Russell,
Spencer Ramsey Smith,
Kenneth Russell Smoot,
John Hubbard Tweedy, Jr.,
Lucius Lincoln Van Slyke,
Elmer Randolph Webster,
Enoch Clark White,
George Deming Wright.

MASTER OF ARTS.

Edward Playfair Anderson,
Hubert William Brown,
Benjamin Chapman Burt, B. A.,
William Henry Butts, B. A.,
Anson Peter De Wolf, B. A ,
William Albert Greeson,
Leroy Halsey,
Jerry Whipple Jenks, B. A.

MASTER OF SCIENCE.

Barclay Tennyson Trueblood, B. S.,

MASTER OF PHILOSOPHY.

Frederick William Nichols, B. S.

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William Taylor Jackson, B. D.

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George Preston Allen,
Charlotte Allen,
Mary Ann Armstrong,
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Herman Augustus Bailey,
Francis L. Bardeen,
Joseph Allen Bean,
James Marshall Bell,
Charles F. Bennett,
Francis Eugene Bortree,
Mary Lavinia Briggs,
John Campbell,
Lafayette Ziba Coman,
Henry Ellis Combacker,
Elizabeth J. Corbett,
Henry Jacob Cordier,
William R. Cullen,
John T. Davis,
Helen E. Deane,
Lyman Carroll Dexter,
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Charles Isaac Eberle,
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Frank Albert Foster,
Samuel Degraw Frederick,
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Pierce J. Fullerton,

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Wilbur Gillett,
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Cepha C. Hall,
Ernest Elbert Hamilton,
George Austin Harding,
George William Harris,
Charles Everett Hebard,
Albert Benjamin Herrick,
Calvin Toy Hilliker,
Willard Holt,
James Porter Howard,
Frank Johnson Hubbard, P. C.,
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Luther Holmes Hulburd,
Edgar S. Johnson, C. E.,
Joshua Jones,
Douglas Arad Joy, M. E.,
Patrick Henry Kiefe,
Michael William Kelly,
William Henry Keyes,
George William King,
Emett Haines Kirk,
Reynold Jerome Kirkland,
E. Wirt Lamoreaux,
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Thomas Jefferson Ritter,
Frank H. Rorick,
Orville Lemon Rowe,
William Edgar Rowe,
Mary Adeline Sanford,
Ellen Amelia Sherman, B. A.,
Henry Albert Shurtleff,
Mary Slade,
William Henry Smith, Ph. D.,
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Alice Martha Stark,
Anna Hall Stewart,
George Washington Stockton,
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Carl Von Ruck, B. S.,
Willis Leaman Walkley,
Dallas Warren,
Eber Kinney Watts, B. S.,
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Bion Whelan, B. S.,
Thomas Herman Wilcox,
Antoinette Williams,
W. A. S. Williams,
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William Henry Adams,
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Charles Chandler, M. A.,
Alphons Richard Claxton,
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Oscar John Fiebing,
Henry Clay Finch, Att'y,
Solomon Thompson Finch,
John Eugene Fishburne,
Frank M. Ford, Att'y,
Charles Gaylord Fowler,
John Hiram Fox,
Willis W. O. Frantz,
Justus Liebig Gable,
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William Donald Gordon,
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John Wesley Gregory, Att'y,
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William Tileston Hall,
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George Haywood, Jr.,
Willis Gaylord Hemenway, Att'y,
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Benjamin F. Hutchins,
Daniel Carpenter Hyde,
Arthur Hancock Ingraham, B. A.,
Sylvester Benjamin Isenhart,
Clarence Lindley Jacobs, Att'y,
Albert Price Johnson, B. A., Att'y,
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John Perry Kellas,

Edward C. Kelly,
John Justus Kerr,
Winfield Scott Kerr,
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Dana Spalding Lander,
Gustav Adolf Laubscher,
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Elbridge Emerson Lewis,
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William Barnard McGrorty,
Frank T. McHenry,
Robert Bishop McKnight, Att'y,
Joseph Rogers McLaughlin, B. S.,
Robert C. McNamara,
Lee K. Mihills,
William Oscar Miller,
Charles J. Monroe,
Fritz Morris,
William Erven Myler, Att'y,
Henry Wirt Newkirk,
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Emil Nusbaumer,
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Lyman De Essa Palmer, Att'y,
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Henry Fillmore Rizer,
James Thompson Robison,
Alison Crestus Roe,
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Cyrus Egbert Rosenkrans,
George Frederick Ross,
Albert Florian Rouse, Att'y,
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Henry Wayne Russell,
Louis Charles Schwerdtfeger,
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Adolph Sloman,
Clarence W. Smith,
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Charles Elliott Solis,
George Washington Somerville,
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Edwin Forrest Steers,
Edward Ives Stimson,
Elias Cephas Stone,
James King Taylor,
Otis David Thompson,
William Henry Townsend,
William Squire Turner,
Edwin Smith Van Deusen,
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Isaac Benjamin English Ward,
Clarence Besher Wardle, Att'y,
Delos Nicholas Weaver,
Lovell Hastings Webb,
Melville Stone, B. S.,
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Walter Webster,
Otway C. Weesner,
Henry Edward Weiskopf,

Dudley Morris Wells,
Charles Alvah Widener,
David John Williams,
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Louie Barney Winsor,
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John Wesley Dill,
Mary Tanner Dill,
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DOCTOR OF DENTAL SURGERY.

John W. Finch.

MASTER OF ARTS.

William H. Barnum.

DOCTOR OF LAW.

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STUDENTS.

RESIDENT GRADUATES.

NAME.		RESIDENCE.
Albert Erastus Barnes, PH. B.,	*University of Michigan,*	Owosso.
Joseph Irving Bates, B. A.,	*University of Toronto,*	Woodstock, Ont.
W. Wadsworth Burt, B. A.,	*University of Michigan,*	Ann Arbor.
Charles Howard Greathouse, B. A.,	*University of Michigan,*	Ann Arbor.
Horace Holmes, C. E.,	*University of Michigan,*	Peru, Ill.
George Washington Lilly, B. A.,	*Ohio Wesleyan Univ'y,*	London, O.
Franc M. Martin, M. A.,	*Ia. Wesleyan University,*	Mt. Union, Ia.
Jabez Montgomery, M. S.,	*University of Michigan,*	Ann Arbor.
Joseph Wilson Parker, B. A.,	*Earlham College,*	Belvidere, N.C.
Alfred Bennett Price, M. A.,	*University of Chicago,*	Cassopolis.
Guilford L. Spencer, B. S.,	*Purdue University,*	Lafayette, Ind.
Barclay Tennyson Trueblood, M.S.	*University of Michigan,*	Hadley, Mo.
Frank A. Wadleigh, B. S.,	*Iowa State University,*	Clinton, Ia.

CANDIDATES FOR DEGREES.

NAME.	DEGREE.	COURSES.	RESIDENCE.
Edgar J. Adams,	B. L.	5 2-5	*Ionia.*
Hattie E. Ailes,	B. L. (L.)		*Ann Arbor.*
Horace Clement Alexander,	B. S.	14 4-5	*Sterling, Ill.*
Frank Gates Allen,	B. A.	13	*Aurora, Ill.*
Josiah Little Ambrose,	PH. B.	18 1-5	*Chicago, Ill.*
Harry Stoddard Ames,	B. A.		*Flint.*
Mattie Elizabeth Arnold,	PH. B.	17 2-5	*Detroit.*
Edward Austin,	B. S.		*Battle Creek.*

NOTE.—For descriptions of the requirements for the various degrees, see pp. 60-65. The figures set against a student's name indicate the number of Full Courses (taken prior to the beginning of the current academic year, 1879-80), which he has completed without conditions. By a Full Course is meant the equivalent of five exercises a week during a semester.

NAME.	DEGREE.	COURSES.	RESIDENCE.
Howard Ayers,	B. S.		*Fort Smith, Ark.*
John Ayers,	M. E.	20 1-5	*Fort Smith, Ark.*
Franklin Corydon Bailey,	B. S.	7	*Ann Arbor.*
Hattie May Bailey,	B. L.	6 1-5	*Grand Rapids.*
Sadie Bailey,	B. L. (L)		*Fulton, Mo.*
Julian William Baird,	B. A.	7 1-5	*Jackson.*
Frank Elisha Baker,	B. A.	6 4-5	*Goshen, Ind.*
Louise Jewett Ball,	B. A.		*Ann Arbor.*
Sarah Elizabeth Bangs,	B. A.	9 4-5	*Ottawa, Ill.*
Edmund Herbert Barmore,	B. S.	2 3-5	*Jeffersonville, Ind.*
Edward Arthur Barnes,	B. A.		*Lansing.*
Orlando Fleming Barnes,	B. A.	15 1-5	*Lansing.*
Marienne Bary,	B. A.		*Detroit.*
S. Willard Beakes,	B. A.	4 4-5	*Bloomingburg, N. Y.*
Junius Emery Beal,	B. L. (L.)	7 3-5	*Ann Arbor.*
Samuel Floyd Beaumont,	M. E.	17	*Peru, Ind.*
Julia Randolph Bell,	B. A.		*Ann Arbor.*
Charles William Belser,	B. A.		*Ann Arbor.*
Emily Augusta Benn,	B. A.		*East Saginaw.*
Brayton Seeley Bennett,	B. A.	6	*Salem.*
John W. Bennett,	B. A.		*Ann Arbor.*
Edward McElroy Benson,	B. A.	6 2-5	*Detroit.*
Lillian Margaret Berkey,	B. A.	6 2-5	*Grand Rapids.*
Lafayette Seavey Berry,	B. L. (L.)		*Prairieville, Ill.*
Fred Betts,	B. A.	2 4-5	*Hillsdale.*
Guy Maynard Bigelow,	B. A.	13 3-5	*Memphis, Tenn.*
Charles Hoge Black,	B. A.		*Detroit.*
Jane Carr Bliss,	B. A.		*Grand Rapids.*
George Webster Borden,	B. A.	17 4-5	*Ann Arbor.*
Frank Pardee Boughton,	B. A.	13 3-5	*Battle Creek.*
Willis Boughton,	B. A.	10 3-5	*Princeton, Ill.*
Edward Henry Bowman,	B. A.	13	*Saint Charles, Ill.*
Arthur A. Boyer,	B. A.		*Walla Walla, W. T.*
Charles Taylor Brace,	B. A.	10 3-5	*Leavenworth, Kan.*
Henry Hall Bradley,	B. A.		*Algansee.*
William Clarence Braisted,	B. L. (L.)		*Ann Arbor.*
Merle Amos Breed,	B. A.	5 1-5	*Ypsilanti.*
William Henry Brenton,	B. S.		*Petersburg, Ind.*
John Marion Brewer,	B. A.	18 4-5	*Romeo.*
Willard Irving Brigham,	B. A.		*Grand Rapids.*
Fred Ernest Britten,	B. A.		*Ann Arbor.*
Benjamin Pitcher Brodie,	B. A.	2 4-5	*Detroit.*

NAME.	DEGREE.	COURSES.	RESIDENCE.
Addison Makepeace Brown,	B. A.		*Schoolcraft.*
Austin Howard Brown, Jr.,	B. S.		*Indianapolis, Ind.*
Edward Miles Brown,	PH. B.	18 4-5	*Schoolcraft.*
Edwin Newton Brown,	B. A.	1 3-5	*Mason.*
George Alfred Brown,	C. E.	12 3-5	*Ann Arbor.*
Randolph Willis Brown,	C. E.	10 3-5	*Rochester, Minn.*
Walter Seymour Brown,	B. S.	5	*Ann Arbor.*
Claude Robinson Buchanan,	B. A.	12 1-5	*Grand Rapids.*
Edward Henry Bull,	B. L. (L.)	6 2-5	*Ottawa, Ill.*
Isaac Howard Bullock,*	B. A.	23 1-5	*Kelton, Penn.*
Ada Bunnell,	B. S.	5 4-5	*Bay City.*
Arthur William Burnett,	B. A.	21 4-5	*Detroit.*
Henry James Butler,	B. A.	8 1-5	*Lionville, Penn.*
William Byron Cady,	B. L. (L.)	6 4-5	*Ann Arbor.*
Charles Hotchkiss Campbell,	PH. B.	19	*Detroit.*
Douglas Houghton Campbell,	B. L. (L.)	6 4-5	*Detroit.*
George Noble Carman,	B. A.	14 1-5	*Ann Arbor.*
Charles Gilbert Chaddock,	B. L. (L.)		*Jonesville.*
Samuel Chandler,	B. A.	12 2-5	*Saint Joseph.*
Florence Charles,	B. L.		*Sioux City, Ia.*
Clarence Herbert Childs,	B. L. (L.)	8 4-5	*Fort Dodge, Ia.*
John Charles Chynoweth,	B. S.	5	*Greenland.*
William Matthews Clapp,	B. S.	3 4-5	*Detroit.*
Mary Elizabeth Clark,	B. L.	6	*Flint.*
Will George Clark,	B. S.		*Wattsburg, Penn.*
Thomas Cowgill Clayton,	B. A.		*Ann Arbor.*
Caroline Clements,	B. A.		*Ann Arbor.*
William Lawrence Clements,	B. S.	4 2-5	*Ann Arbor.*
Ellen L. Clothier,	B. L.	19 4-5	*Fredonia, N. Y.*
Charles Lewis Coffin,	B. S.	8 4-5	*Sandusky, O.*
Fred G. Coldren,	B. A.	6 4-5	*Northville.*
Edwin Locke Cole,	B. L.	6 1-5	*Ann Arbor.*
Festus Clark Cole,	PH. B.	12	*Ann Arbor.*
Sumner Collins,	B. A.	6	*Macon.*
Kate Ellis Coman,	PH. B.	20	*Hanover, O.*
John Josiah Comstock,	B. A.		*Colona, Ill.*
William Wilson Cook,	B. A.	16 2-5	*Hillsdale.*
Roger William Cooley,	B. L.	4 3-5	*Decorah, Ia.*
Ismena Cramer,	PH. B.	19	*Ann Arbor.*
Isaiah Reed Crossette,	B. A.	13	*Three Rivers.*

---

* Deceased.

Name.	Degree.	Courses.	Residence.
Lewis Franklin Culver,	B. A.	18 1-5	*Quincy.*
Mittie May Curtis,	B. L. (L.)	5 2-5	*Ann Arbor.*
George Brown Daniels,	B. A.	12 4-5	*Grand Rapids.*
Eliza Darling,	Ph. B.	13 1-5	*Laporte, Ind.*
Frederick William Davenport,	B. L. (L.)	7 2-5	*Eureka, Ill.*
Edward Sweat Davis,	C. E.	16 3-5	*Waxahatchie, Texas.*
Mary W. Dawson,	B. A.	5 1-5	*Pontiac.*
John Philander Delphey,	B. L. (L.)	6 3-5	*Erie.*
George Alonzo Derby,	B. S.		*Jamestown, N. Y.*
Benjamin Leonard D'Ooge,	B. A.	10 4-5	*Grand Rapids.*
John William Dorst,	C. E.	12 1-5	*Detroit.*
Benjamin Douglas,	B. S.	6	*Detroit.*
Charles Levi Dubuar,	B. A.	18 3-5	*Northville.*
Evered Curtis Dudley,	B. A.		*Grand Rapids.*
Bethune Duffield,	B. A.		*Detroit.*
James Czar Dunning,	B. L. (L.)		*Paw Paw.*
Charles Howard Durham,	B. A.	6 2-5	*Ravenna, O.*
Ellen Eastman,	B. L. (L.)	7	*Flint.*
Arthur Dunning Eddy,	B. L.		*East Saginaw.*
Malcolm Woodworth Edgar,	B. L. (L.)	7 4-5	*Flushing.*
Edmund West Eede,	B. S.		*Kingsville, Ont.*
Joseph Washington Errant,	B. A.		*Chicago, Ill.*
George M. Llewellyn Erwin,	B. A.		*Southfield.*
John Thomas Ewing,	B. A.	21	*Ionia.*
Jane Eyer,	B. A.	12 2-5	*Chicago, Ill.*
Edmund Elwood Fall,	B. A.		*Walla Walla, W. T.*
Katharine Eliza Farrand,	B. L. (L.)		*Laporte, Ind.*
William Edward Fenwick,	B. L. (L.)	9 3-5	*Detroit.*
George Lee Fisher,	C. E.	18	*Pontiac.*
Henry Allen Fitzsimmons,	B. A.	6	*Reading.*
William W. Follett,	B. S.	7 4-5	*Newfane, N. Y.*
Duane Edwin Fox,	B. A.	13 4-5	*Grand Rapids.*
Allan Howard Frazer,	Ph. B.	13	*Detroit.*
Maurice Pixley French,	B. L. (L.)	5 3-5	*Milwaukee, Wis.*
Jay Fuller,	Ph. B.	19 4-5	*Buchanan.*
James Frederic Gallaher,	B. A.	5 4-5	*Hillsdale.*
Margaret Grace Garvey,	B. L. (L.)		*Springfield, Mass.*
Walter Brown Garvin,	B. A.		*Weston, Mo.*
Don Alonzo Garwood,	B. A.	15 2-5	*Cassopolis.*
Anna Bordwell Gelston,	Ph. B.	12 2-5	*Ann Arbor.*
Arthur Mills Gelston,	B. A.	7 1-5	*Ann Arbor.*
James Chester Gibbs,	B. A.		*Kalamazoo.*

NAME.	DEGREE.	COURSES.	RESIDENCE.
Frank Herbert Gilbert,	B. L. (L.)		*Zanesville, O.*
Marcia Gilmore,	B. L. (L.)	7	*Denver, Col.*
Fred Harris Goff,	PH. B.	14	*Cleveland, O.*
Charles Watson Goodrich,	B. A.	12 2-5	*Milwaukee, Wis.*
Mary Henrietta Graham,	PH. B.	19 2-5	*Ann Arbor.*
William Herbert Graham,	B. A.	6 4-5	*Grand Rapids.*
John Henry Grant,	B. A.	6 3-5	*Burlington, Ind.*
Henry Ballard Graves,	B. L. (L.)	5 3-5	*Battle Creek.*
Ralph Gray,	B. A.		*Marysville.*
Robert Toms Gray,	B. L. (L.)	6 4-5	*Detroit.*
John Alexander Green,	B. A.	19	*Austin, Texas.*
Thomas C. Greene,	PH. B.	21 4-5	*Troy, N. Y.*
Effie Griffith,	B. A.	5	*Greenville.*
Nat Gunter,	PH. B.	6	*Sherman, Texas.*
Frederick James Gurney,	B. A.	20 2-5	*Chicago, Ill.*
P. Bradshaw Haid,	B. A.		*Ann Arbor.*
Norman Washington Haire,	B. A.	19	*Leslie.*
Albert Barlow Hale,	B. A.	6 2-5	*Chicago.*
Arthur Gillespie Hall,	B. A.	14 2-5	*Cazenovia, N. Y.*
Ferdinand Hall,	B. S.	3 3 5	*Westfield, N. Y.*
Sarah G. Hamilton,	B. L. (L)	6 3-5	*Jacksonville, Ill.*
Will Washington Hannan,	B. A.	19	*Dowagiac.*
Mary Lucy Harding,	B. L. (L.)	6 2-5	*Detroit.*
K. D. Harger,	B. S.		*Pontiac.*
Linda Enos Harris,	B. L.		*Laporte, Ind.*
James William Harsha,	B. A.		*Circleville, O.*
Elnathan Pierce Hathaway,	B. L.		*Ottawa, Ill.*
John Evangelus Hathaway,	B. S.	10 3-5	*Milwaukee, Wis.*
Henry William Hawley,	B. L. (L.)		*Fort Dodge, Ia.*
Thomas Lorenzo Heaton,	B. L.	20 4-5	*Potsdam, N. Y.*
Mary Hegeler,	B. S.	9 2-5	*Lasalle, Ill.*
William Helmle,	B. A.	19	*Springfield, Ill.*
Carrie D. Henderson,	B. A.		*Pontiac.*
Annie May Herdman,	B. L. (L.)		*Zanesville, O.*
James Byron Herrick,	B. A.	6	*Oak Park, Ill.*
William Simon Hill,	B. A.	12 2-5	*Ann Arbor.*
Laura Hills,	B. L. (L.)	6 2-5	*Chicago, Ill.*
E. Harold Hilton,	B. A.	10 2-5	*Ann Arbor.*
John Flavel Hinman,	B. A.	9	*Battle Creek.*
Norman Dwight Hinsdale,	B. A.		*Ottawa, Ill.*
Charles Wellman Hitchcock,	B. A.	22 1-5	*Kalamazoo.*
Edward Bailey Hitchcock,	B. S.	3 1-5	*Ann Arbor.*

NAME.	DEGREE.	COURSES.	RESIDENCE.
Frank Heywood Hodder,	B. L. (L.)		*Aurora, Ill.*
Herbert Augustus Hodge,	B. L.	13 1-5	*Concord.*
Charles H. Hodges,	B. S.	2 3-5	*Detroit.*
William Henry Honey,	B. A.	20	*Ypsilanti.*
David E. Hoover,	C. E.	12 3-5	*Ionia.*
Maurice Major Houseman,	PH. B.	14 4-5	*Grand Rapids.*
Abbie Euretta Howe,	B. A.	11 2-5	*Ypsilanti.*
James Edward Hunt,	B. A.	19	*Toledo, O.*
Mary Elizabeth Hunt,	B. L. (L.)		*Ann Arbor.*
Ormond Fremont Hunt,	B. A.	13 2-5	*Ann Arbor.*
Wetmore Hunt,	PH. B.	14	*Detroit.*
Ledru Rollin Hunter,	B. A.	18 2-5	*South Lyon.*
Charles Hutchinson,	PH. B.	14	*Ceresco.*
Louis Howard Hyde,	B. L. (L.)	5 1-5	*Joliet, Ill.*
Jesse Allen Icenhour,	B. L. (L.)	2 3-5	*Columbiana, O.*
Charles Edward Ilsley,	B. L. (L.)	6 2-5	*Milwaukee, Wis.*
Edward Israel,	B. A.	16 3-5	*Kalamazoo.*
Annie Delight Jackson,	B. L.		*Wood River, Neb.*
John Henry Jennings,	B. A.		*Fenton.*
Francis Joseph Jennison,	B. A.		*Detroit.*
Frank Arthur Johnson,	B. A.	17	*Ann Arbor.*
William Robert Johnson,	B. A.	7	*Steubenville, O.*
Collins Hickey Johnston,	B. A.	12 2-5	*Detroit.*
William Kemper Jones,	B. A.	20 3-5	*Grand Rapids.*
Alexander Edward Kastl,	B. S.		*Detroit.*
Willard Franklin Keeney,	B. A.		*Grand Rapids.*
John Kelly, Jr.,	B. A.	13 3-5	*Detroit.*
DeForest Kendall,	B. A.	1	*Terre Haute, Ind.*
Annie Marie Kimball,	B. A.	6 1-5	*Grand Rapids.*
Howard Hannibal Kimball,	B. S.	6 1-5	*Columbus, O.*
William C. King,	B. S.		*Watrousville.*
Homer Hitchcock Kingsley,	B. A.	13 3-5	*Kalamazoo.*
Charles Hannibal Kumler,	B. A.	12 2-5	*Dayton, O.*
James R. Laing,	B. S.	20 4-5	*Ann Arbor.*
George Anthony Lederle,	C. E.	8 3-5	*Detroit.*
Frank Bruce Leland,	B. A.	6 4-5	*Byron.*
Jeptha Elmer Lemon,	B. A.		*Ann Arbor.*
W. Leigh Liggett,	B. A.	13 1-5	*Detroit.*
Clarence Ashley Lightner,	B. A.	6 3-5	*Detroit.*
William Albert Locy,	B. S.	13 2-5	*Flint.*
Peter Burr Loomis, Jr.,	B. A.	18 1-5	*Jackson.*
William Leonard Loveland,	B. L.	5 1-5	*Golden, Col.*

Name	Degree.	Courses.	Residence.
Florence May Lyon,	B. L.		*Medina, N. Y.*
Edward Frederick Mack,	B. S.	3 1-5	*Ann Arbor.*
David Mackenzie,	B. A.	15	*Detroit.*
Henry Symes Mahon,	B. L. (L.)	5 4-5	*Ann Arbor.*
William L'Estrange Mahon,	B. L. (L.)	4 3-5	*Ann Arbor.*
Frank Chittenden Mandell,	B. A.	12 3-5	*Detroit.*
Henry Addison Mandell,	B. L. (L.)		*Detroit.*
Alma Mansfield,	B. A.	11 3-5	*Ann Arbor.*
William Elmore Martin,	B. L. (L.)	6 1-5	*Milwaukee, Wis.*
Willis Corydon Marsh,	B. L. (L.)		*Decorah, Ia.*
Elford Randolph McCormick,	B. L.		*East Saginaw.*
Flora McDonald,	B. A.		*Ann Arbor.*
William Hunter McEwan,	B. S.	6 3-5	*Bay City.*
Charles King McGee,	B. A.	18 4-5	*Jackson.*
Andrew C. McLaughlin,	B. A.	5 4-5	*Muskegon.*
John Alexander McLennan,	B. A.		*Lapeer.*
Charles McMurry,	B. A.	7 2-5	*Normal, Ill.*
Frank McNamara,	Ph. B.	13 2-5	*Lapeer.*
William Clayton Miller,	C. E.	12 3-5	*Marquette.*
Charles Sumner Mitchell,	Ph. B.	18 4-5	*Saint Cloud, Minn.*
William Hosmer Mitchell,	B. A.	6 4-5	*Port Huron.*
John Morris, Jr.,	B. A.		*Fort Wayne, Ind.*
Robert Graves Morrow,	B. L. (L.)		*Niles.*
Maggie Morton,	B. A.	12 1-5	*Ann Arbor.*
Henry Elmer Moseley,	B. A.		*Grand Rapids.*
John Joseph Alonzo Murphey,	B. A.		*La Grange, Ill.*
Harry M. Musgrave,	B. A.	6	*Charlotte.*
Eugene C. Nardin,	Ph. B.	7 2-5	*Belle Branch.*
David Sealy Naugle,	B. A.	1	*Beaver Falls, Penn.*
Thomas Azro Noftzger,	B. L. (L.)		*North Manchester, Ind.*
James Hill Norton,	B. L.	7 4-5	*Brimfield, Mass.*
Leroy Stephen Norton,	Ph. B.	17 3-5	*Ann Arbor.*
M. Estelle Norton,	B. A.	13	*Ann Arbor.*
Rollo Blakesly Oglesbee,	B. L. (L.)	3 3-5	*Plymouth, Ind.*
Harry Garnsey Ohls,	B. L. (L.)		*Hinsdale, Ill.*
William James Olcott,	B. L. (L.)		*Ishpeming.*
Amy Alice Orcutt,	B. S.		*Ann Arbor.*
Horace Mann Oren,	B. A.	11	*Miami, Ind.*
Frank Lincoln Osborn,	B. A.	6 4-5	*Tecumseh.*
Henry Putnam Page,	B. A.		*Ann Arbor.*
Edward Brooks Palmer,	B. S.		*Grand Blanc.*
Delos Leonard Parker,	Ph. B.	9 1-5	*Marine City.*

NAME.	DEGREE.	COURSES.	RESIDENCE.
Carrie Cook Parrish,	B. A.	18 2-5	*Ann Arbor.*
Frederick Pynsent Partridge,	B. A.	7 4-5	*Flint.*
Isaac Newton Payne,	B. A.	6	*Port Clinton, O.*
John William Payne,	B. S.		*Port Clinton, O.*
Theodore Wing Peers,	B. L. (L.)		*Collinsville, Ill.*
Herbert Maury Pelham,	PH. B.	12	*Plymouth.*
Moss Kent Perkins,	B. A.	13	*Ann Arbor.*
Willard Fountain Pett,	B. A.		*Ann Arbor.*
Willis Edgar Phinney,	B. S.		*Coldwater.*
Samuel J. Platt,	B. A.		*East Saginaw.*
Allen Bartlit Pond,	B. A.	18 3-5	*Ann Arbor.*
Alden Howland Potter,	B. A.		*Ann Arbor.*
Albert Jay Potter,	B. A.	22 1-5	*Niles.*
Carrie Ellen Preston,	B. A.		*Detroit.*
Stella Prince,	B. A.	19 1-5	*Jacksonville, Ill.*
Reinhardt Rahr,	B. S.	3 2-5	*Manitowoc, Wis.*
Ida May Redson,	B. A.		*East Saginaw.*
Charles John Reed,	B. A.	6 3-5	*Morris, Ill.*
Frank Fremont Reed,	B. A.	18 1-5	*Ann Arbor.*
John Oren Reed,	B. L. (L.)		*Mount Summit, O.*
Jacob Elsworth Reighard,	B. L. (L.)	7 2-5	*Laporte, Ind.*
Rowland Henry Rerick,	B. S.	14	*La Grange, Ind.*
Henry Slade Richards,	PH. B.	19	*Paw Paw*
Harry Chase Richardson,	B. A.	10	*Princeton, Ill.*
James Albert Ridenour,	B. A.		*Toledo, O.*
Eugene V. Riker,	B. A.		*Fenton.*
William Douglas Robbins,	B. A.	6 4-5	*Tecumseh.*
Fred Austin Robinson,	B. A.	6 3-5	*Detroit.*
Edward Adolphus Rosenthal,	B. A.		*Fort Wayne, Ind.*
Frank Atherton Ross,	B. L. (L.)		*Terre Haute, Ind.*
Thornton William Sargent,	B. A.	3 1-5	*Piketon, O.*
Frank Peck Satterlee,	M. E.	19 3-5	*Birmingham.*
Louis Sax,	B. A.	14 4-5	*Milwaukee, Wis.*
Alfred Schanz,	B. A.		*Detroit.*
Stuart Niblo Schermerhorn,	B. A.	13 3-5	*Grand Rapids.*
William F. Schirmer,	B. A.		*East Saginaw.*
Samuel Balsom Schoyer,	B. A.	4 3-5	*Pittsburgh, Pa.*
John Giles Schurtz,	B. A.	13 4-5	*White Pigeon.*
Mabel Ethelwyn Schuyler,	B. A.		*Ann Arbor.*
Orielle Schuyler,	B. A.	10 3-5	*Ann Arbor.*
Wilfrid Hamilton Schuyler,	B. L. (L.)	6 3-5	*Ann Arbor.*
Job Hart Scott,	B. A.	12	*Brighton.*

Name.	Degree.	Courses.	Residence.
Osman Cooley Seelye,	B. A.	17 3-5	*Ann Arbor.*
Clarence William Sessions,	Ph. B.	13 2-5	*Ionia.*
Levi Franklin Shaw,*	B. A.	2	*Cheboygan.*
Henry Gray Sherrard,	B. A.	7 1-5	*Tecumseh.*
Edwin Stanton Sherrill,	B. A.	18 4-5	*Detroit.*
Bowen Wisner Shoemaker,	B. A.	6 2-5	*Jackson.*
Carman Newcomb Smith,	B. L. (L.)		*Independence, Ia.*
Edwin Norton Smith,	B. A.		*Romeo.*
Joseph Warren Smith,	B. A.	22 3-5	*Eaton Rapids.*
George Perren Soyer,	B. L.		*East Saginaw.*
Hinton Ellsworth Spalding,	B. A.	7 1-5	*Gallipolis, O.*
Henry Hall Spencer,	B. A.	6 1-5	*Richland.*
John Jacob Spencer,	B. S.		*East Saginaw.*
Nellie Abby Stanley,	B. A.	12 1-5	*Ann Arbor.*
George Walter Staple,	B. A.	9 3-5	*Cleveland, O.*
Frances Odell Stebbins,	B. L.		*Sheridan, N. Y.*
Arthur Kissel Stimson,	B. L. (L.)		*Detroit.*
Samuel Marston Stocker,	Ph. B.	19 4-5	*Muscatine, Ia.*
Adelbert C. Story,	B. L. (L.)	7 2-5	*Greenville.*
William Streeter,	B. A.	6 4-5	*Quincy.*
Jennie Sweetser,	B. A.		*Port Huron.*
Thomas Carlyle Tate,	Ph. B.	12 2-5	*Keokuk, Ia.*
Almon Nicholas Taylor,	B. A.	6	*Portland, N. Y.*
David Gray Taylor,	B. A.		*Fenton.*
Harriet B. Taylor,	B. A.	12 4-5	*Almont.*
Charles Edward Temple,	B. A.	4-5	*Grand Rapids.*
Frank Taylor Terry,	B. A.	12 1-5	*Milwaukee, Wis.*
Jefferson Ray Thomas,	B. S.	21 2-5	*North Plains.*
Malcolm Parker Thomas,	B. A.	19 1-5	*Schoolcraft.*
James McKean Thompson,	B. A.		*Dexter.*
William Mann Thompson,	Ph. B	13 4-5	*Jackson.*
Anna Louise Tindall,	B. L.	6 2-5	*Flint.*
Charles Watson Tinsman,	B. A.	6 2-5	*Romeo.*
Homer Ellsworth Tinsman,	B. A.		*Romeo.*
Charles Arnette Towne,	Ph. B.	11 1-5	*Spring Lake.*
Fred Murraie Townsend,	B. A.	14 3-5	*Coldwater.*
Charles Wellington Tufts,	B. A.	21 3-5	*Leslie.*
Joel Claverly Tyler,	B. A.	22	*Kalamazoo.*
Stewart Orson Van DeMark,	B. L. (L.)		*Ann Arbor.*
Kittie Van Harlingen,	B. L. (L.)		*Ann Arbor.*

---

* Deceased.

NAME.	DEGREE.	COURSES.	RESIDENCE.
Alice Van Hoosen,	B. A.	18 4-5	*Rochester.*
Lydia J. Van Housen,	B. A.	18 3-5	*Prattsburgh, N. Y.*
Willard D. Van Tuyle,	B. L. (L.)		*Clinton.*
Christine Louise Voigt,	B. L. (L.)		*Detroit.*
Byron Sylvester Waite,	B. L.	22 2-5	*Fenton.*
Fernando Arthur Walker,	B. A.		*Taunton, Mass.*
Isaac Osborne Walker,	B. S.		*Albion.*
Charles Christopher Wamsley,	B. A.		*Huntertown, Ind.*
Rufus Waples, Jr.,	B. A.	5 4-5	*Ann Arbor.*
Warren Buck Warner,	B. S.		*Byron.*
Francis Day Weeks,	B. A.		*Detroit.*
Samuel C. Weiskopf,	B. S.	7	*Milwaukee, Wis.*
Robert Green West,	B. L. (L.)	7 4-5	*Austin, Texas.*
Jean Augustus Wetmore,	B. S.	11 3-5	*Concord.*
Will Turner Whedon,	PH. B.	12 4-5	*Ann Arbor.*
Asa Devillo Whipple,	B. A.	13 3-5	*Plymouth.*
Charles Chace Whitacre,	PH. B.	20 2-5	*Chicago, Ill.*
Edwin Ewer White,	B. A.	6	*East Bloomfield, N. Y.*
Joseph Mandeville White,	B. A.	10	*Elizabethtown, Mo.*
Edwin Kirby Whitehead,	B. A.	15 2-5	*Coldwater.*
Everett Jerome Whitehead,	B. A.	13 1-5	*Fenton.*
Frederick William Whiting,	B. L. (L.)	6 4-5	*Detroit.*
Louis Davenport Wight,	B. L.	12 3-5	*Detroit.*
David Tracy Wilcox,	B. L.		*Dexter.*
Freeman William Wilcox,	B. A.	3 4-5	*Pinckney.*
George Wiley,	B. L. (L.)	6 4-5	*Detroit.*
Charles Trowbridge Wilkins,	B. L. (L.)		*Detroit.*
John F. Wilkinson,	B. A.		*Berrien Springs.*
Charles Dwight Willard,	B. A.		*Chicago, Ill.*
John Haun Willard,	PH. B.	19 2-5	*Chicago, Ill.*
Ella Cornelia Williams,	B. A.	24 4-5	*Watkins, N. Y.*
Samuel Long Williams,	B. A.	13	*Lapeer.*
Scott Williams,	B. A.		*Ann Arbor.*
Sarah Bishop Willits,	B. L. (L.)		*Reading.*
Charles Gaston Wilson,	PH. B.	13 3-5	*Sturgis.*
Charles Moseman Wilson,	PH. B.	16 2-5	*Ionia.*
Harold Beckwith Wilson,	B. S.	4 1-5	*Ann Arbor.*
John Thomas Winship,	B. A.		*Washington, D. C.*
Frank Elmer Wood,	B. A.	8 4-5	*Fort Dodge, Ia.*
Sheldon Alva Wood,	B. A.	11 4-5	*Fenton.*
Charles Howard Worden,	B. L. (L.)		*Fort Wayne, Ind.*
Frank Forbes Wormwood,	B. A.		*Rockford, Ill.*

NAME.	DEGREE.	COURSES.	RESIDENCE.
Frank Ludowick York,	B. A.	6 2-5	*Williamson.*
Max Zinkeisen,	B. A.	16	*Milwaukee, Wis.*

STUDENTS WHO ARE NOT CANDIDATES FOR DEGREES.

NAME.	RESIDENCE.
Mary Elizabeth Allen,	*Benton Harbor.*
Charles Stephen Bartholf,	*Plainfield, Ill.*
William Edward Beeson,	*Seville.*
Hannah Lee Bird,	*Atchison, Kan.*
Frank Seldon Buckley,	*Ann Arbor.*
Fannie S. Burt,	*Ann Arbor.*
Hettie E. Burton,	*Saint Joseph.*
Georgiana Carman,	*Ann Arbor.*
Loomis Eaton Chapin,	*Farragut, Ia.*
Hattie A. Chapin,	*Fenton.*
Ira Washington Christian,	*Noblesville, Ind.*
George Lamont Chubb,	*Grand Rapids.*
James Hawkins Clark,	*Friar's Point, Miss.*
Laura Clay,	*Lexington, Ky.*
Hattie Marie Collier,	*Battle Creek.*
William Henry Cook,	*Chicago, Ill.*
Charles Albert Crampton,	*Moline, Ill.*
May France Douglas,	*Romeo.*
Charles Emerson Goodrich,	*Traverse City.*
Lyman Nelson Graves,	*Ypsilanti.*
Louis Philip Hall,	*Ann Arbor.*
Will K. Higley,	*Ann Arbor.*
Fred C. Jacquet,	*Albion.*
Andrew John Kline,	*Mendon.*
William Harrison Mace,	*Terre Haute, Ind.*
Mary Jane Malcomson,	*Detroit.*
Harry McNeil,	*Union City, Ind*
Hattie Mason,	*Ann Arbor.*
David Edward Osborne,	*Chardon, O.*
Charles Reed,	*Oakland, Cal.*
Martha Elnora Rumsey,	*Grand Rapids.*
Jennie Elizabeth Scranton,	*Grand Rapids.*
Morris Charles Shaw,	*Cheboygan.*

NAME.	RESIDENCE.
Ella Sherwood,	*Saint Joseph.*
Dora Isabella Smith,	*Centreville, Ala.*
Emma Smith,	*Kalamazoo.*
Ophelia Smith,	*Saint Louis, Mo.*
Herbert Montgomery Snow,	*Dearborn.*
John W. Sowden,	*Calumet.*
E. Josephine Talford,	*Grand Rapids.*
Florence L. Talford,	*Grand Rapids.*
Nettie L. Taylor,	*Almont.*
Job Tuthill,	*Washingtonville, N. Y.*
Anna Underhill,	*Chappaqua, N. Y.*
Wilson Aulette Waller,	*Trenton, Ky.*
Clara Weir,	*La Grange, Ind.*
Allen Sisson Whitney,	*Mount Clemens.*
George Beaumont Whitney,	*Muskegon.*

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STUDENTS.

Name.	Residence.	Preceptor.
Horace Selden Allyn,	*Plymouth,*	C. B. Allyn.
Fanny Perkins Andrews,	*Ann Arbor,*	Faculty.
N. William Andrews,	*Adrian,*	C. Rynd.
David Muirehead Angus,	*Morefield, Ont.,*	R. E. Clapp.
William Lamont Axford,	*Flint,*	Faculty.
William Henry Aylsworth,	*Leoni,*	Faculty.
Charles Anson Babcock,	*Ann Arbor,*	H. S. Taft.
James Hanley Bache,	*Woodstock, Ont.,*	J. Brown.
Charles Emmet Bailey,	*Northfield,*	Faculty.
Frank Dymond Baker,	*Flint,*	B. Cogshall,
Fred Baker, B. S., Cornell University.	*Norwalk, O.,*	George G. Baker.
Elmer Irving Balcom,	*Grafton, Mass.,*	Faculty.
Sarah Collins Baldwin,	*Winchester, Mass.,*	Faculty Boston Univ.
Arthur D. Bangham,	*Marshall,*	J. F. Smiley.
Jose C. Barbosa, B. A., College of Porto Rico.	*Porto Rico, W. I,*	Faculty.
Agnes Barry Barlow,	*Grand Rapids,*	J. B. Griswold
Oliver William Barrett,	*Three Rivers,*	W. M. Ikeler.
E. Wendell Bartram,	*Ovid,*	Faculty.
William Thomas Batterson,	*Durbin's Corners, O.,*	Faculty.
Sarah A. Beardsley,	*Clintonville, N. Y.,*	F. J. Dangnon.
Isaac Lewis Beatty,	*Summum, Ill.,*	Faculty.
James Addison Beebe,	*Ann Arbor,*	Faculty.
Ralph Palmer Beebe,	*Odessa, N. Y.,*	B. T. Smilyer.
William H. Begg,	*Columbus, O.,*	H. H. Smith.
Robert Blanchard Bell,	*Howell,*	W. L. Wells.
Ebenezer O. Bennett,	*Ann Arbor,*	A. Collar.
Judson Henry Bennett,	*Gobles,*	L. D. Knowles.
Leolin Edmond Bennett,	*Fort Smith, Ark.,*	J. E. Bennett.
Strong Mosher Bennett,	*Mexico, N. Y.,*	A. K. Hale.
Anna Lobdell Benson,	*Gambier, O.,*	Dr. Jane Payne.
Joseph Valentine Berrios,	*Porto Rico, W. I.,*	Faculty.
Fred Darius Bickford,	*Marshall,*	J. T. Smiley.

NAME	RESIDENCE.	PRECEPTOR.
Lewis George Blakeslee,	*Belding,*	George Blakeslee.
Benjamin Davis Bond, B. A., Amherst College.	*Kohala, H. I.,*	Faculty.
David Edward Bowman,	*Gibsonburg, O.,*	J. B. & R. H. Rice.
Horace Bunnel Boyd,	*Pittsburgh, Penn.,*	E. S. Stephenson.
Ira Newton Brainard,	*Grand Blanc,*	Faculty.
Arthur Holmes Brown,	*Cortland, N. Y.,*	N. D. Ferguson.
Harlan Jackson Brown,	*West Batavia, N. Y.,*	L. L. Tozier.
Mary J. E. Brown,	*San Jose, Cal.,*	Dr. Brown.
Ralph Alton Brown,	*Zionsville, Ind.,*	G. N. Duzan.
Victoria Adelaide Brown,	*Rochester, N. Y.,*	S. J. McCam.
John Brueckner, PH. B., Bamberg College, Germany.	*Shelburn Falls, Mass.,*	Dr. Canedy.
H. Herbert Bucknum,	*Parma,*	A. M. Bucknum.
Charles Wesley Burgess,	*Bethany, Mo.,*	Faculty.
John Byram,	*Dover, N. J.,*	J. D. King.
Donald W. Campbell,	*Belmont, Ont.,*	J. B. Campbell.
John Luther Campbell,	*Royal Oak,*	Faculty.
William Aulls Campbell,	*Ypsilanti,*	Faculty.
William B. Campbell,	*Mapleton, Ont.,*	J. B. Campbell.
Ellen S. Calligan,	*Elmira, N. Y.,*	Faculty.
William Pitt Carpender,	*Butler, Ind.,*	G. W. Carpender.
William Bayard Carroll,	*Vermontville,*	W. Parmenter.
John Henry Carty,	*Fair Haven, Vt.,*	W. E. Howard.
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Samuel Chagnon,	*Montreal, P. Q.,*	Faculty.
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John Johnston Miller, Ph C.	*Knoxville, Ill.*,	Faculty.
James Finley Moore,	*Decatur, Ill.*,	S. J. Burnsted.
Addison Morgan,	*Detroit,*	P. B. Morgan.
Charles Harry Myers,	*Ann Arbor,*	Faculty.
Charles Henry Penniman,	*Oakland, Cal.*,	C. B. Bradley.
J. Walter Pennock,	*Adrian,*	J. Kemberling.
Willis P. Polhemus,	*Marshall,*	Faculty.
Theodore Oliver Potter,	*Whiteford,*	Wm. Watts.
Llewellyn Bartlett Richards,	*Quincy,*	C. E. Smith.
Glenn Arthur Roberts,	*Brandon, Vt.*,	A. T. Woodward.
Seaver Chauncey Ross,	*Towanda, Penn.*,	D. S. & D. L. Pratt.
Fred Ruggles,	*Lyndon Centre, N. Y.*,	W. A. Doulson.
Emma Moore Snyder,	*Newark, N. Y.*,	H. P. VanDusen.
Christopher Howard Skeels,	*Lockport, N. Y.*,	Faculty.
Emeline Tanner,	*Ann Arbor,*	Faculty.
Edward Parish Thatcher,	*Shortsville, N. Y.*,	H. P. VanDusen.
Franklin Russell Timmerman,	*Nashville,*	H. A. Baker.
Genevieve Tucker,	*Nashua, Ia.*,	L. M. Tucker.
Frank Harold Tyler,	*Three Rivers,*	Faculty.
James Waite Vidal,	*Randolph, N. Y.*,	W. C. Praslee.
Joshua Vought,	*Rome, Penn.*,	J. H. Spaulding.
Jane A. Walker,	*Salem,*	A. L. Walker.
James F. Welch,	*Ionia,*	T. R. Allen.
Jared Wetmore,	*Grand Rapids,*	Dr. Willett.
Ashley Jay Williams,	*Ann Arbor,*	Faculty.

SUMMARY BY STATES,

AND IN DEPARTMENTS.

STATES AND COUNTRIES.	Resident Graduates.	Undergraduates.	Select.	Total in the Literary Department.	Department of Medicine and Surgery.	Department of Law.	Pharmacy.	Homœopathic Medical College.	College of Dental Surgery.	Total in the University.
Michigan	5	251	30	285	139	121	43	31	19	642
Ohio	1	19	1	21	34	67	7	3	19	151
Illinois	1	34	4	39	16	47	5	2	10	118
New York	......	14	2	16	37	17	7	13	8	98
Indiana	1	21	3	25	21	36	3	1	4	90
Pennsylvania	......	5	......	5	19	20	1	7	7	59
Iowa	2	10	1	13	7	12	3	1	1	37
Ontario	1	1	......	2	13	7	1	4	......	27
Minnesota	......	2	......	2	8	12	2	1	1	26
Missouri	1	3	1	5	7	6	3	......	1	22
Wisconsin	......	10	......	10	6	3	1	......	1	21
Kansas	......	1	1	2	3	9	1	......	1	16
Massachusetts	......	3	......	3	8	2	1	......	......	14
Vermont	......	......	......	......	5	5	......	1	1	12
California	......	.....	1	1	1	2	......	3	2	9
Kentucky	......	......	2	2	......	3	1	......	2	8
Oregon	......	......	......	......	2	6	......	......	......	8
New Jersey	......	......	......	......	3	3	......	......	1	7
Connecticut	......	......	......	......	3	2	1	......	......	6
New Hampshire	......	......	......	......	1	3	......	......	......	4
Colorado	......	2	......	2	1	1	......	......	......	4
Texas	......	4	......	4	......	......	......	......	......	4
Maine	......	......	......	......	1	2	......	......	......	3
Arkansas	......	2	......	2	1	......	......	......	.....	3
Mississippi	......	......	1	1	......	2	......	......	......	3
Nebraska	......	1	......	1	......	2	......	......	......	3
District of Columbia	......	1	......	1	1	......	......	......	1	3
Maryland	......	......	......	......	2	1	... ..	......	......	3
Utah Territory	......	......	......	.....	1	2	......	......	......	3
Washington Territory	......	2	......	2	1	......	......	......	......	3
Alabama	......	......	1	1	1	......	......	......	......	2
Tennessee	......	1	......	1	......	......	......	......	......	1
North Carolina	......	......	......	1	......	......	......	......	......	1
South Carolina	1	......	......	......	......	1	......	......	......	1
Florida	......	......	......	.....	......	1	......	.....	......	1
Nevada	......	......	......	......	1	......	......	......	......	1
Idaho Territory	......	......	......	.....	1	......	......	......	......	1
Province of Quebec	......	......	......	......	1	......	1	......	......	2
New Brunswick	......	......	......	......	1	......	......	......	1	2
England	......	......	......	......	1	......	......	......	1	2
Porto Rico, W. I.	......	......	......	......	2	......	......	......	......	2
Bermuda Islands	......	......	......	......	1	......	......	......	......	1
Holstein, Prussia	......	......	......	......	......	......	......	......	1	1
Rangoon, Burmah, (Asia)	......	......	....	......	1	......	......	......	......	1
Japan	......	......	......	......	......	......	......	......	1	1
Hawaiian Islands	......	......	......	......	1	......	......	......	......	1
Total	13	387	48	448	350	395	81	70	83	1427

STUDENTS.

NAME.	RESIDENCE.	PRECEPTOR.
Fred Stephens Anderson,	*Pittsfield,*	Faculty.
William Berry Armendt,	*Owensboro, Ky.,*	J. H. Taylor.
George Post Ashton,	*Warrensburg, Mo.,*	G. C. Shepard.
Wilbert George Bean,	*Detroit,*	A. Ames.
Thomas Wesley Beckwith,	*Sycamore, Ill.,*	O. H. Smith.
Henry Franklin Billmeyer,	*Brooklyn,*	S. R. Nicknin.
Uriah Dildine Billmeyer,	*Tecumseh,*	Faculty.
Albert Victor Bills,	*Oakland, Cal.,*	Faculty.
William Fairman Bradner,	*Bedford,*	B. F. Miller.
Ephraim David Brower,	*Ackley, Ia.*	J. K. Morris.
George Hart Brown,	*Romeo,*	E. A. Stebbins.
Charles Robert Calkins,	*Perry, N. Y.,*	C. G. Bartlett.
David Ethelbart Callaghan,	*Yokohama, Japan,*	J. B. Brown.
John Peter Carmichael,	*Rockford, Ill.,*	B. J. Kellogg.
Fred Bower Clapp,	*Lena, Ill.,*	Faculty.
Suel Erastus Clark,	*Fredonia, N. Y.,*	L. P. Kingsley.
Edward Carroll Condict,	*Dover, N. J.,*	Faculty.
George Henry Corey,	*Bristolville, O.,*	F. C. Corey.
Henry C. Corns,	*Detroit,*	W. Walton.
George Coughlin,	*Liberty, Ind.,*	J. L. Grove.
Lewis Crain,	*Erie, Penn.,*	W. E. McGill.
Hiram De Puy,	*Pittsburgh, Penn.,*	M. De Puy.
Williams Donnally,	*Georgetown, Ky.,*	Practitioner.
Henry Edgar Dunn,	*Meadville, Penn.,*	Cyrus Lee.
Charles Albert Eckert,	*Trenton, O.,*	Faculty.
Alban Vaughan Elliott,	*Washington, D. C.,*	G. Thomas.
Almos Elias Eminger,	*Germantown, O.,*	B. B. Stevens.
Fred N. Emrick,	*Germantown, O.,*	George L. Payne.
Orion Jonathan Fay,	*Flat Rock,*	Faculty.
Alma W. E. Fuellgraff,	*Elmshorn, Holstein, Germany,*	Faculty.
Stephen Humbert Gerow,	*St. Johns, N. B.,*	J. F. Thompson.
Frank F. Hoyer,	*Lockport, N. Y.,*	C. Watts.
Alfred Wright Hoyt,	*Fond du Lac, Wis.,*	A. L. Hoyt.
Margaret Humphreys,	*Yellow Springs, O.,*	G. L. Paine.
Mulford Schuyler Hunter,	*Detroit,*	C. H. Land.
Ormand Courtland Jenkins,	*Ann Arbor,*	W. H. Jackson.
Aaron Churchill Johnson,	*Leslie,*	J. S. Moffitt.
Augustus C. Johnson,	*Fenton,*	J. N. Collins.

NAME.	RESIDENCE.	PRECEPTOR.
Edward Lincoln Kellogg,	*Atchison, Kan.,*	W. H. Shultz.
George Frederick Kimball,	*Ypsilanti,*	J. A. Watling.
Henry Fairbanks Kimball,	*Chicago, Ill.,*	Z. P. Haskell.
Jennie Catharine Kollock,	*Chicago, Ill.,*	F. W. Brophy.
Thomas Chalmers Leiter,	*Wadsworth, O.,*	G. N. Seeley.
Frank Flavius Little,	*Bristolville, O.,*	T. M. McCabe.
John James Little,	*Keepville, Penn.,*	F. F. Little.
Amos Marion Long,	*Monroe,*	D. S. Quickel.
Ira S. Loomis,	*Mexico, N. Y.,*	H. H. Dobson.
Charles Maclean,	*Ann Arbor,*	W. H. Jackson.
Ossian C. Moon,	*Richland, Ind.,*	J. W. Jay.
Guy Hamilton Morgan,	*West Bridgewater, Penn.,*	J. G. Templeton.
Arthur Clayton Nichols,	*Ann Arbor,*	W. W. Nichols.
Adelbert Thomas Olmsted,	*La Salle, Ill.,*	J. F. Mariner.
Charles Upton Patrick,	*Terre Haute, Ind.,*	Bartholomew & Hall.
Clarence Doolittle Peck,	*Kent, O.,*	J. C. Merritt.
Denton E. Peterson,	*Waterloo, N. Y.,*	C. D. Hoyt.
Evelyn Pierrepont, Licentiate, Royal College Surgeons Ireland.	*Manchester, England,*	Practitioner.
Douglas Potterf,	*Defiance, O.,*	J. S. Scott.
William John Poyser,	*Canton, O.,*	A. J. Douds.
William Henry Priestman,	*Neponset, Ill.,*	Faculty.
Rush Minor Putnam,	*Palatine, Ill.,*	E. W. Olcott.
John Nelson Reynolds,	*Lanesboro, Penn.,*	H. Pennepacker.
Collins McKnight Roe,	*Ontario, O.,*	S. Wadner.
Henry Horace Rogers,	*Fairbury, Ill.,*	Faculty.
Ira Emmit Sampsell,	*Columbiana, O.,*	H. A. Sampsell.
William Wilson Shryock,	*New Era, Ind.,*	Faculty.
Charles J. Siddall,	*Oberlin, O.,*	D. P. Siddall.
Malcolm Sinclair,	*Ann Arbor,*	Faculty.
Charles A. Sipe,	*Galion, O.,*	V. H. Reisenger.
Arthur Everett Smith,	*Jamestown, N. Y.,*	E. H. Danforth.
Willard Judson Spencer,	*Le Roy,*	Faculty.
Immer Crittenden St. John,	*Winona, Minn.,*	W. F. Lewis.
Charles Edwin Stroud,	*Sandusky, O.,*	C. T. Stroud.
Maurice James Sullivan,	*San Francisco, Cal.,*	L. L. Dunbar.
John Silvers Tucker,	*El Paso, Ill.,*	M. H. Patten.
Alvin Ellis Unger,	*Adamsville, Penn.,*	F. H. Whiteside.
Oliver Stacy Voak,	*Watkins, N. Y.,*	W. A. Spence.
Julius Charles Waldron,	*Brimfield, O.,*	W. J. Caris.
Howard S. West,	*Vershire, Vt.,*	S. Gustin.
Wilbur Silvius Whisler,	*Tiffin, O.,*	J. W. Hayford.
R. Clark Williams,	*New Philadelphia, O.,*	T. Williams.
Frank Duane Wilson,	*New Lisbon, O.,*	Dr. McLean.
Lawson DeForest Wood,	*Malone,*	Faculty.
Robert Addison Young,	*Romeo,*	I. Douglas.

SUMMARY OF STUDENTS.

DEPARTMENT OF LITERATURE, SCIENCE AND THE ARTS.

Resident Graduates	13	
Candidates for Degrees	387	
Students not Candidates for Degrees	48—	448

DEPARTMENT OF MEDICINE AND SURGERY.

Students—Total in the Department		350

DEPARTMENT OF LAW.

Seniors	180	
Juniors	215—	395

SCHOOL OF PHARMACY.

Resident Graduate	1	
Second Year	33	
First Year	47—	81

HOMŒOPATHIC MEDICAL COLLEGE.

Students—Total in the College		70

COLLEGE OF DENTAL SURGERY.

Students—Total in the College		83
		1427

UNIVERSITY OF MICHIGAN.

THE

PRESIDENT'S REPORT

TO THE

BOARD OF REGENTS,

FOR THE YEAR

ENDING JUNE 30, 1872.

ANN ARBOR:
PUBLISHED BY THE UNIVERSITY
1872.

COURIER PRINT, ANN ARBOR, MICH.

PRESIDENT'S ANNUAL REPORT.

To the Honorable, the Board of Regents :

I have the honor to present to you my report for the academic year, which is now drawing to its close. Our work during the last twelve months has been marked by no such important events as several which signalized the administration of my predecessor in office, acting President Frieze. The admission of women to our classes, the gift of the Parsons (Rau) Library, the establishment of our new relation with the High Schools of the State, and the generous appropriation of the legislature for the erection of our new building, render the two years during which Dr. Frieze discharged the duties of the Presidency ever memorable in the history of the University. The influence of the scholarly enthusiasm, the ripe academic experience, and the happy mixture of caution with enterprise which he brought to his work, still abides with us as a helpful force.

The year has been one of quiet, earnest and successful labor. The teachers have performed their duties with the greatest harmony and fidelity, and the students have, as a body, been exemplary and assiduous. The pervading spirit of the University has been that of cheerful, spirited devotion to the work in hand.

THE FACULTIES.

The following gentlemen were appointed, at the close of last year, or at the beginning of this year, and have performed the duties of their respective posts:

Theodore McGraw, M. A., M. D., Lecturer on Surgery.

P. R. B. De Pont, B. A., B. S., Instructor in French and Drawing.

W. W. Beman, B. A., Instructor in Mathematics.

Robert Harbison, M. A., Instructor in Modern Languages and Literature.

F. A. Blackburn, M. A., Instructor in Latin.

Marcus Baker, B. A., Instructor in Mathematics.

Edward L. Mark, B. A., Instructor in Mathematics.

Three of the Faculty have been absent through the year by permission of the Regents; professors Frieze and D'Ooge, in Europe, and Mr. Harrington, on an expedition to Alaska. Prof. Frieze will remain abroad another year, engaged in higher philosophical studies. Prof. D'Ooge expects to resume his work in September. Acting Professor Elisha Jones, who has been occupying the chair of Greek during Prof. D'Ooge's absence, will be released from service here. It gives me pleasure to bear witness to the ability, scholarship and industry which he has brought to his work. Mr. Harrington expects to be at home early in the next academic year. Dr. McGraw has resigned his lectureship on Surgery. Mr. J. Burkitt Webb, who was appointed assistant Professor of Civil Engineering in September, resigned his place in November. Since April 8th, Mr. Charles S. Denison, C. E., has been employed as an assistant to the Professor of Civil Engineering.

Death has recently struck an honored name from our Faculty roll, that of Zina Pitcher, M. D., Emeritus Professor of the Institutes of Medicine and Obstetrics. Though he never gave instruction in the University, his fifteen years of valuable service in the Regency and his specially important work in giving form to our Medical school secure him a conspicuous place in our annals. Our Faculties of instruction have this year consisted of thirty-eight men, twenty-eight of whom were employed in the Academic Department, four in the Law Department, and six in the Medical Department Four gave instruction both in the Academic and in the Medical Department. As three members of the Academic Faculty were absent, the number of teachers actually on duty was thirty-five, two more than were employed in the previous year.

NUMBER OF STUDENTS.

The total number of students in attendance during the year is 1,224, which probably exceeds by about one hundred the number who were present during the previous year. Our calendar this year gives the names of 1,207 actually in attendance prior to its publication. Seventeen students came afterwards. The catalogue of the year before shows an attendance of 1,110 before its publication. It may be interesting to compare the figures of each Department for the two years, as shown by the catalogues.

	1870–71	1871–72
Academic Department,	488	509
Medical,	315	350
Law,	307	348
Total,	1110	1207

The complete table of attendance for the whole year 1871–2 is as follows:

DEPARTMENT OF LITERATURE, SCIENCE AND THE ARTS.

Resident Graduates,	9	
Seniors,	84	
Juniors,	73	
Sophomores,	97	
Freshmen,	168	
In Selected Studies,	46	
In Pharmacy,	40	
Total,	517	

DEPARTMENT OF MEDICINE.

Students,	354	

DEPARTMENT OF LAW.

Seniors, 142—Juniors, 211; total,	353	
Total in University,		1224

It will be seen that there is a handsome gain in every department. The attendance upon the Law school is much larger than that upon any other similar school in the country and the total attendance in the University is, I think, greater than at any other American College or University. The gain in the Academic Department is the more noticeable since the examinations for admission were more rigid than ever before. Nearly fifty applicants for admission, about twenty per cent. of all, were refused. Yet the Freshman class was the largest which has ever entered the University. Their average age on entering was about 19½ years.

Of the entire number in attendance, 1224, Michigan furnishes 577, or about 47 per cent. Last year her part was 46 per cent. Her proportion in the Academic Department is nearly twice as great as in the professional schools, thus, in the former about 64 per cent of the whole, in the Medical Department 35 per cent, in the Law Department 34 per cent. Stated otherwise, the fact is, that nearly twice as large a proportion of professional as of collegiate students come from other States. This would be expected in considering how great is the number of American colleges in comparison with the number of professional schools. Our students come from 28 States and Territories, from Ontario (Canada), New Brunswick and the Sandwich Islands. Ohio sends us 134; Illinois, 124; New York, 87; Indiana, 56; Pennsylvania, 39. The New England States furnish us 37, as follows: Maine, 5; New Hampshire, 2; Vermont, 12; Massachusetts, 12; Rhode Island, 1; Connecticut, 5. Ontario sends us 29. These simple figures give us impressive suggestions of the wide reach of the work of the University.

NUMBER OF GRADUATES.

The graduates in the several courses this year are as follows:

Pharmaceutical Chemists,	5	
Mining Engineer,	1	
Civil Engineers,	10	
Bachelors of Science,	12	
Bachelors of Philosophy,	7	
Bachelors of Arts,	57	
Doctors of Medicine,	89	
Bachelors of Laws,	142	
Masters of Science (in course),	7	
Masters of Arts (in course),	10	
Master of Arts (on examination),	1	
Total,		341

In one case two degrees, and in another three degrees, were conferred on the same person. The number of persons actually receiving degrees were, therefore, 338.

In addition three honorary degrees were conferred: one of M.D., one of A.M., and one of LL.D.

THE CHOICE OF COURSES.

It is gratifying to see that there is an almost universal desire on the part of the undergraduates to pursue some complete course. It should be understood that of the forty-six students, who are described in our Calendar as pursuing selected studies, probably there are not more than ten, who do not intend to earn a place in some one of our regular courses. Lacking for a time the proficiency in some study, which is requisite for standing in the class with which they hope to graduate, they are placed in this category. For we mean that our Calendar shall be rigorously honest and truthful. And we aim to place no man on the roll of a class, until he is fully up with the work of that class. There is a very encouraging tendency among those, who come to pursue selected studies, to become inspired by their life here with an aspiration to remain and complete some thorough cour e It should furthermore be remarked that of those who are registered as pursuing selected studies there are always a few experienced teachers who have come to study some branch as a speciality.

As our students are permitted to elect their courses, it is instructve to observe the nature of their choices. We may group our several courses (excluding the Pharmaceutical, which properly considered forms a special department by itself) under three general heads, one, in which Latin and Greek are both pursued; another, in which only one of the ancient tongues, (and that is almost without exception, the Latin) is studied, and the modern languages, mathematics and the sciences receive more attention than in the first; and a third, in which the ancient languages are not taken up at all, but modern languages, mathematics, and the sciences receive chief attention. The Engineering courses, and the course in Analytical Chemistry, are included in this. These various courses are of equal length, four years, and as the studies are now arranged, the scientific studies are certainly not less laborious than the others. Calling them, the first, the Classical, the second, the Latin and Scientific, and the third, the Scientific, the students in the four classes this year are divided as follows*: Classical 194 (46 per cent.); Latin and Scientific, 81 (19 per cent.); Scientific, 147 (35 per cent.); total, 422.

On comparing these figures with those in the catalogue of 1867–8 I find that the percentage of the scientific students is almost exactly the same to-day as it was then. At that time it was 36 per cent. In 1861–2 it was 28 per cent. In ten years there has been a gradual, but not a very rapid, relative increase of scientific students. I may remark in this connection that there is a constant tendency for a certain proportion of the students, who enter upon the Scientific course, to make special preparation and pass over to the Classical or the Latin and Scientific course, and for a certain proportion of those, who enter upon the Latin and Scientific course, to transfer themselves to the Classical. Those timid friends of classical learning who have feared that it would be abandoned in our colleges, if scientific studies were admitted to equal honor with the classical, and those scientists who suppose that there is no real and intelligent demand for classical training, especially in the West, may with equal profit scrutinize these figures.

THE WORK DONE.

For details of the work done in the various departments, I refer you to the accompanying reports of the Deans of the Medical and Law Faculties, and of the professors in the Department of Literature, Science and the Arts. You will find there the record of a year's faithful and successful labor. The Faculties have given themselves with earnestness to their duties. The students have been very punctual in attendance, and as a whole have met the demands upon them with fidelity. A good number of the examinations in the Academic Department have been made, I think, somewhat more rigorous than heretofore, and it would be well if still others were made more searching. As a result of the examinations at the close of the first semester twenty students failed so badly in some one study that they are required to take it again with the next class behind them. Eighty-two were so deficient that they were "conditioned," that is, required to sustain a re-examination on one or more studies on a specified day in the next semester, and nine showed so little knowledge of their studies that their parents were requested to withdraw them. Six of these were Freshmen, and three were pursuing selected studies. The failure of most of the Freshmen was due in some degree to inadequate preparation, and they may be permitted on due preparation to enter the next class. Three other Freshmen had, by advice of the Faculty, been previously withdrawn to extend their preparatory studies.

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* The select students are excluded from this classification.

As a result of the examinations held in the second semester seventy-six were "conditioned," and eight "failed to pass" on some study.

No student has subjected himself to the gravest censure of the University. The connection of one student with the Institution was indefinitely suspended for neglect to attend his classes, and that of two others was suspended for a year on account of their prolonged absence without permission.

As I have not before been accustomed to see college classes working without a "marking system," I may properly say that I am fully convinced by what I have seen here, at least of the uselessness of such a system for students like ours. I have never seen a better average of class work than I find here in the classes of the teachers, who insist on having good work done by their pupils, and who possess in a fair degree the power of inspiring them with enthusiasm.

Some of our professors, in addition to their class-room labors, have this year reflected honor upon the University by making valuable contributions to the literature of their respective departments. Professor Wood has published a treatise on The Strength of Materials, and Professor Olney a School Algebra and a treatise on Geometry and Trigonometry, to be followed by other mathematical works. Both the work of Professor Wood and those of Professor Olney have met with a hearty reception in a very large number of the better colleges and schools of the land. Dr. Cocker has delivered to the students a course of his lectures on the Evidences of Christianity, which were listened to by large audiences and have been published by the senior class. He has also in press an elaborate work on Christianity and Modern Thought. Acting Professor Jones, in connection with Professor Boise of Chicago, has prepared a text-book to guide pupils in writing Greek prose.

THE OBSERVATORY.

Professor Watson's report explains the nature of the work which has been done at the Observatory. It will be observed that the Professor has discovered three planets this year, making fourteen in all, which are credited to our Observatory since he took charge of it.

It is greatly to be desired that the Observatory should be furnished from some source with the moderate endowment required for its wants.

REQUIREMENTS FOR ADMISSION.

It has already been intimated that the examinations for admission were more rigid and exacting last year than they had been before. We are also gradually demanding a larger range, as well as a better quality of preparatory work. At the coming examination for admission into the Latin and Scientific course we are to ask a year's previous study of French. Next year we shall require the same acquaintance with French, and a knowledge of the elements of Natural Philosophy, Botany, Geology and Zoology, as the condition of entering the Scientific course. In the following year more Latin than is now required is to be asked of those who take the Classical course. This is in accordance with the general plan to raise the grade of our work as rapidly as the preparatory schools can raise theirs. We keep up constant communion with the superintendents and teachers to determine how far they can readily carry their students before they transfer them to us. They show a most praiseworthy desire to push up the scale of their work. I cannot use too strong language in expressing the indebtedness of the University to these faithful instructors in the High Schools of the State, who are striving with zeal and wisdom to lift the grade of work in their schools, and so to enable us to begin our University work on a higher plane. Of course we must take care not to raise our requirements more rapidly than the schools can raise their work with the hearty approbation of the people whose taxes support them.

THE UNIVERSITY AND THE HIGH SCHOOLS.

It is with great pleasure that I refer to the first year's experience in forming a quasi organic connection between the University and the High Schools. It will be remembered that if the Faculty on the report of a Committee of Inspection, approve the work of a school, then the University receives without examination the graduates of that school, provided their certificates from their school board or superintendent declare that they have successfully pursued all the studies required for admission to our Freshman class. This promise to receive the graduates of the schools binds the University only for the year in which the inspection is made. Last year we received 50 Freshmen on certificates, viz., 3 from the Detroit High school, 8 from Flint, 7 from Jackson, 3 from Kalamazoo, 1 from Adrian, and 28 from Ann Arbor. We see nothing in the result of the experiment to deter us from repeating it.

Those who predicted the filling up of the Freshman class with poor material, or the lowering of the standard of scholarship in consequence of this step, have proved false prophets. Of the Freshmen, who were "conditioned" or who "failed to pass" at the examinations of the past year, a decidedly larger percentage is found in that portion of the class which entered on examination than in that portion which was received on certificate. This is only one test, it is true. But the indication which it furnishes that the students, who entered by certificate, were on the whole better prepared than those who entered after examination, is in accordance with the general impression, which the daily class-room work has made on the instructors of the class. There is the very strongest evidence that the effect upon the schools which stand in this new relation to the University, has been most helpful. It has lent a new stimulus to the scholars, teachers and friends of the school. The visits of the Committee of Inspection have been received as gratifying proof of the interest of the University in the schools. The conferences with the teachers and superintendents, have been instructive both to them and to us. We have frankly and kindly suggested methods of improving their work, where suggestions were needed, and they have enabled us to see exactly what is possible for them to do. We are thus able to co-operate wisely and intelligently for the same end, the most thorough preparation of students for our classes. The schools become thoroughly identified with us in our work. When the High Schools generally in the State shall have so far advanced that the University can establish this relation with them, we shall have a completely graded system of substantially free public education stretching from the primary school through the University to the completion of a professional course.

Committees of the Faculty have this year, in compliance with invitations, visited the schools at Ann Arbor, Adrian, Jackson, Flint, Kalamazoo and Pontiac. The Faculty have voted to receive graduates this year from all the above named schools save that at Pontiac, which has no class ready for us this year. If the quality of the teachers in that school next year is as good as at present, it will doubtless earn a place by the side of the best schools. Other schools announce that they will be prepared to invite inspection next year. Though our plan is still subjected to some criticism, I am convinced that if it is executed with discretion and prudence, it can be made productive of great good to the schools, the University and the State. There is hardly any feature of our work which seems to me more interesting than this.

THE ADMISSION OF WOMEN.

The number of women who are availing themselves of the opportunity to study at the University is nearly twice as great as it was in year 1870–71. The number registered then was 34, viz.: 2 in the Law Department, 18 in the Medical Department, and 14 in the Academic Department. This year the number has been 64, viz.: 3 in the Law Department, 33 in the Medical, and 28 in the Academic. These last are distributed in the classes as follows: Seniors, 2; Sophomores, 7; Freshmen, 13; in select courses, 6. Of these in the regular courses, eight are Classical students, nine Latin and Scientific, and five Scientific. Five of those in the select courses are giving their attention chiefly to scientific studies and modern languages and literature; the sixth to classical work. Six women graduated in April with the medical class, one with the law class, and two now graduate in the Academic Department. In the Medical Department the women have received instruction by themselves, except in chemistry. In the other Departments all instruction is given to both sexes in common.

It is manifestly not wise to leap to hasty generalizations from our brief experience in furnishing education to both sexes in our University. But I think all who have been familiar with the inner life of the University for the past two years, will admit that, thus far, no reason for doubting the wisdom of the Regents' action in opening the University to women has appeared. Hardly one of the many embarrassments which some feared, has confronted us. The young women have addressed themselves to their work with great zeal, and have shown themselves quite capable of meeting the demands of severe studies as successfully as their classmates of the other sex. Their work so far does not evince less variety of aptitude or less power of grappling even with higher mathematics than we find in the young men. They receive no favors and desire none They are subjected to precisely the same tests as the men. Some of them, like the men, have stumbled at examinations, but nearly all of them have maintained a most creditable reputation for scholarship in every branch of study which has awaited them in their course. Nor does their work seem to put a dangerous strain upon their physical powers. They assure me that they never enjoyed better health, and their absences by reason of sickness does not proportionately exceed those of the men. Their presence has not called for the enactment of a single new law, or for the slightest change in our methods of government or grade of work. If we are asked still to regard the reception of women into our classes as an experiment, it must certainly be deemed a most hopeful experiment. The numerous inquiries which are sent to me from various parts of this country and even from England, concerning the results of their admission to the University, show that a profound and wide-spread interest in the subject has been awakened. Cornell University has recently decided to open its doors to women,and it can hardly be doubted that other conspicuous Eastern colleges will soon follow the example. The Alumni and Trustees of at least four prominent New England colleges are formally considering the subject.

THE MUSEUM.

Professor Winchell's report will describe in detail the additions to our scientific collections. We have received some valuable accessions. Especially noteworthy are the objects collected by Mr. J. B. Steere on his expedition across the South American continent. We have already received from him 1205 entries, 4538 specimens, and several boxes are now on the way here. Mr. Steere, having traversed South America, now goes to New Zealand.

A few contributions of value have been made to the Art Gallery, the most valuable being the marble medallion portrait of the distinguished sculptor, Randolph Rogers, who so long resided here, and who is represented in our gallery by two of his works, the "Nydia" and the "Ruth Gleaning." This medallion, from the chisel of the sculptor Cushing, is the gift of Hon. C. C. Trowbridge, of Detroit, who has so often testified his deep interest in the welfare of the University.

I cannot think it untimely to direct the attention of the friends of the University, who take a just pride in our collection of works of art, to the importance of having a more commodious gallery constructed with special reference to the preservation and exhibition of such works. I am confident that if we had such a structure, fire-proof, and properly lighted, we could easily procure every year numerous additions to our collection. It need not at present be large or expensive. If we should erect a new hall for our library, it might be added as a wing. It is evident that the rooms now occupied for the purpose will soon be needed for scientific collections. The erection of such a gallery would do much to stimulate that study of the Fine Arts, to which we should speedily give attention in the University.

THE LIBRARY.

It appears by the Librarian's report that the library has been increased during the year by the addition of 883 volumes, and 181 pamphlets. Of these 249 volumes and 171 pamphlets were presented. A hundred and seventy-four reviews, magazines and newspapers are on the tables. Sixty-five of them are furnished by the Students' Reading Room Association. Considerable progress has been made in the cataloguing and binding of the Parsons Library. It is with peculiar pleasure that I inform you of the thoughtful generosity of the graduating class in making a subscription of more than $1,100 for a library fund, the interest of which is to be appropriated to the purchase of books. There is reason to hope that this may become the nucleus of a large fund to be given by the Alumni and other friends of the University.

THE PROFESSIONAL SCHOOLS.

Great prosperity attends both of these schools. Still greater results could be achieved by them if we could secure higher preparatory training in the students. How to secure this is not easy to say. It is evident, however, that the gradual and rapid elevation of the work in our public schools is doing much to relieve the difficulty. I think the proportion of college graduates in the law school this year was greater than ever before, there being 61 in the class of 350. In the medical school, however, there were only 14 in a class of equal size. This is a subject which deserves most serious consideration. I am not prepared at present to make any recommendations about it.

I beg, however, to express my hearty approval a plan proposed by the Medical Faculty, through their Dean, for extending the course of lectures from the present term of six months over one of nine months, thus securing more thoroughness of instruction. The execution of the plan will, however, probably ultimately entail an additional expense of $3,000 annually, though I am informed that the professors would be willing to give these longer courses without additional recompense for the present, or until the treasury of the University may be in a condition to increase their remuneration. I hope we may ere long see our way clear to add a Dental department to our Medical school. The increased expense would be so slight, and the patronage would probably be so large, that it is not improbable that it could be conducted without much, if any, cost to the University.

It is of great importance that we enlarge our hospital accommodations at the earliest practicable day. The present hospital has been of essential service to us. But the time has come for a vigorous effort to secure through private or public benefactions a large hospital for the treatment of special diseases, or a State hospital for the treatment of the sick, who are now in the various alms-houses of the State. I cannot but think that the enterprise will commend itself to the medical profession of Michigan, and to the favorable consideration of the public.

I venture to commend the needs of the Law Library to the consideration of all who are interested in the highest success of our flourishing Law Department. This Library is the only apparatus which this department asks to be supplied with for its large and important work. As no other department brings so large pecuniary return to the University in proportion to the expense it entails, it is but just that the library be supplied with liberality. The deficiencies upon its shelves are serious.

UNIVERSITY HALL.

University Hall, the corner stone of which was laid on last Commencement Day, has been pushed on toward completion as rapidly as the means at our disposal would allow. Had the whole appropriation instead of half of it been available last February, the new hall might have been occupied for Commencement exercises this year, and the remainder of the interior would have been now nearly completed. It is our expectation that the lecture rooms, and perhaps the chapel, will be ready for use at the beginning of the academic year in the coming September. And that will not be too soon. We were much embarrassed last autumn in accommodating our large classes. It would be impossible to find room for our students in our old recitation rooms next year, if the coming Freshman class should be as large as the last. But our new building will furnish us the needed relief. It will provide us with eleven new lecture rooms, offices for the Regents, the President, the Faculty, and the Steward, a waiting room for the ladies, and a spacious and elegant hall, which will contain sittings for twenty-five hundred or more hearers. As there was no hall or church in town, which would accommodate the audience often in attendance upon our public exercises, an auditorium of this kind, was almost as urgently needed as our new lecture rooms. The most rigid economy has been practiced in erecting the new building, but the legislative appropriation will probably not quite suffice for its completion. May we not hope that our generous patron, the State of Michigan, to which we are indebted for the means of carrying the structure so near to its completion, will furnish us the little that is now required to finish the work? University Hall with its front of 347 feet, and its dome rising to a height of 140 feet from the ground, is one of the most imposing college edifices in the land.

It would add greatly to the interest of the services in the new chapel, and of many of the exercises to be held in the large hall, if these rooms were furnished with organs of suitable size. They are so obviously needed that we cannot but hope that some friend of the University may furnish them to us. I have ascertained on inquiry that in Germany two organs suitable for these halls respectively, can be procured for about $3,000.

OUR NEEDS.

A prosperous institution of education always desires and generally needs some things which it has not. We are fulfilling that condition of prosperity. Our very successes compel us to ask for the means of achieving higher success. Our enlarged numbers, the constant elevation of our scale of study, the widening range of instruction in all the better colleges and universities of the country, are calling for larger facilities and larger work in this institution.

Our rapidly increasing classes imperatively demand an increase in the number of our instructors, even if we do not expand the range of our work at all. I think we greatly need another instructor at once in the rhetorical department, who should teach elocution and do some rhetorical work with the Freshmen and Sophomore classes, both of which should have more practice in writing under critical direction.

The Professor of History also requires help in conducting his unmerous classes. One instructor might perhaps for the present be employed to divide his labors between these two departments.

We should also have, at an early day, a Professor to give instruction in Political Economy, Political Philosophy, and International Law. The very brief course in Political Economy has been conducted by the Professor of Moral and Intellectual Philosophy, who would prefer to confine himself to his own special work, and it has not been offered at all to the classical students. I have this year given twenty familiar lectures on International Law to about two-thirds of the Senior class. But provision should be made by which every student should be able to take a generous course in the Political Sciences.

I have already spoken of the importance of a gallery for works of Art.

A large and well appointed gymnasium would in my opinion be of great service, especially during that large part of the year in which outdoor games cannot be resorted to for exercise. I believe that the moral, as well as the physical effect, would be salutary and marked.

But there is another and greater need which cannot long remain disregarded without serious detriment to our good name. We must have the means of enlarging the facilities for certain kinds of scientific work, or peril our honorable position among the better institutions of the land, and come short of our duty and opportunity as a University. Our deficiencies are most marked in our provisions for instruction in Mechanical and Mining Engineering, Physics, Metallurgy, and Assaying, though our means of illustration in Civil Engineering and in Zoology are not adequate to our needs.

The Professors, by their assiduity and ability, have done excellent work with the means at their command. But the kind and amount of work in these branches, which were satisfactory a few years ago, are no longer so. Larger attainments are desired by an increasing number of students who are training themselves for the actual technical application of some of the sciences, or for chairs of instruction in science. Nearly all the stronger colleges have been vigorously striving for the last few years to meet this acknowledged demand for more extended training in science, and several schools have been founded, with large endowments, for the sole purpose of imparting that sort of instruction.

I desire to commend to the careful attention of the friends of the University, the report which Prof. Wood, Professor of Civil Engineering made on this subject to the Regents at their March meeting. He estimates that the cost of such a building as we need for enlarged scientific work, and the requisite apparatus, and of the endowment of the new Professorships required, will be $373,500. Whether that plan or some other is adopted to secure the end, at least that sum of money will be needed, and half a million of dollars could be used without extravagance. Is there not some citizen of Michigan who will leave on our grounds an enduring monument to his memory, and a fountain of perpetual blessing to the State and the nation, by founding such a department and erecting such a building?

But the execution of such a plan is the work of time. Some of the minor wants, however, in these branches of work, ought to be supplied at once.

The department of Physics is in pressing need of apparatus. The Adjunct Professor asks for a moderate appropriation, which I hope can be furnished at this session.

Professor Winchell's department (Geology, Zoology and Botany,) needs thorough reorganization and expansion, at an early day, in accordance with suggestions in a report from him, which I herewith submit. But he should have at once an Assistant to aid in giving instruction. I recommend that Mr. M. W. Harrington, who has been proved to be a capable scholar and instructor in that department, be named Instructor in of Geology, Zoology and Botany. I think that the employment of a taxidermist, who can be procured for a small sum, would be economical for the University.

But after all, our first and greatest need is such an increase in our revenue as will enable us to meet the deficit with which we are threatened at the close of the next fiscal year. While we seem to be absolutely under the necessity of increasing our expenses, we find ourselves confronted with the stern fact that our income must be less after next June than it has been for the last two years. I believe that it will be difficult to find a college in the land in which more work is returned for every dollar of outlay. The most careful economy is employed in every department. The most searching scrutiny upon this point may be challenged. May we not then look with confident expectation of relief from our impending embarrassment to the generosity of the State, which has never failed to appreciate and supply our most pressing wants?

APPENDIX.

REPORTS

From the Deans of the Professional Schools, and from the Professors of the Academic Faculty.

I.

REPORT FROM PROF. SAGER, DEAN OF THE MEDICAL FACULTY.

To the President of the University:

SIR,—At your suggestion I herewith submit a brief report of the Department of Medicine and Surgery, for the academic year 1871–2.

The session comprises a period of six months, from October 1st to March 28th, during which period, with the exception of a recess of a week during the holidays, four lectures per week are given to each of the medical classes, male and female, in separate lecture rooms, and as nearly as practicable, with the following distribution of subjects, viz.:

Anatomy and Physiology, eight lectures per week. Chemistry. Organic and Inorganic, eight lectures per week. Materia Medica and Therapeutics, eight lectures Ditto. Surgery, Civil and Military, eight lectures Ditto. Obstetrics, Gynœcology, and Pædiotrics, eight lectures. Theory and Practice of Medicine, eight lectures. Opthalmology, two lectures per week, half the term.

Beside these courses of didactic instruction, clinical lectures were delivered for three hours on every Saturday, upon Surgery and Practice, with numerous operations, and practical demonstrations.

Students were also permitted to witness operations at the Hospital, upon patients that could not be brought before the class, and to examine patients, and witness the treatment, in both the male and female wards of the Hospital.

In addition to the didactic and clinical teaching, frequent oral examinations were held by different members of the Faculty during the evenings, and an occasional examination upon medical topics, of the senior class, in writing, to test their literary as well as medical scholarship.

The afternoon was chiefly occupied in the Anatomical and Chemical Laboratories, a very large proportion of the students taking the courses in both Practical Anatomy and Chemistry.

The entire number of students attending the School was three hundred and fifty, and 92 classes in Practical Anatomy were formed. In the Chemical Laboratory, 195, or about three-fifths of the class, engaged in the study of Practical Chemistry.

A separate course of about fifteen exercises was given, chiefly to the senior class, in Physical Diagnosis.

II.

REPORT FROM PROF. COOLEY, IN BEHALF OF THE LAW FACULTY.

To the President of the University:

SIR,—On behalf of the Department of Law, I respectfully submit:

That its work for the last year presents no new or noticeable features. The attendance of students has been fully equal to the average of recent years; the steady increase of new schools not appearing as yet to affect this Department in any appreciable degree. The number upon whom the degree of Bachelor of Laws was conferred was in advance of that of any former year, and we notice some improvement in the average preparation of those who seek instruction here. Of the wants of the Department I believe you are fully sensible, the chief being a considerable increase to the Library, and some provision for a permanent librarian. These wants we trust the Regents will supply as speedily and as completely as the means at their command will allow. With a larger attendance of students than at any other Law School in the country, we yet have an exceedingly meager and insufficient library, and in consequence feel our inability to do full justice to those who place themselves under our instruction.

III.

REPORT OF S. H. DOUGLASS, PROFESSOR OF CHEMISTRY, AND DIRECTOR OF CHEMICAL LABORATORY.

To the President of the University:

SIR,—It gives me great pleasure to report that the Chemical Department has, in the past year, had the usual degree of prosperity. The number of students, particularly in the higher branches of applied chemistry, has materially increased. It is true the number of candidates recommended in Pharmacy is small. This arises from the more exacting terms of graduation instituted. The course in Pharmacy is accomplishing all its most sanguine friends could have anticipated, and I hope will prove a credit to the University, and a great benefit to the country at large.

I submit the following exhibit of the number of students in the various courses in the Laboratory of Applied Chemistry:

Whole number of students, (1871–2,)	267
Number of weeks of total attendance,	3081
Number of students from Medical Department,	195
“ “ “ Pharmacy “	43
“ “ “ Academical “	29
“ “ Seniors, “ “	15
“ “ Ladies,	27
Number of arranged courses of Laboratory work,	9
“ students in Abridged Analysis,	142
“ “ Qualitative “	60
“ “ Quantitative “	31
“ “ Toxicology,	18
“ “ Urology,	143
“ “ Phar. Manip.,	22
“ “ Determinative Mineralogy,	5
“ “ Assaying,	2
“ “ Organic Analysis,	7

The following is an exhibit of the Lectures and Class Drills in the various courses:

Lectures on Chemical Physics and Inorganic Chemistry, to the Medical Class, four times per week, from Oct. 1st to Feb. 1st, by Prof. Douglass.

Lectures on Toxicology, to the Medical Class, once a week from Feb. 1st to March 28th, by Prof. Douglass.

Lectures on Organic Chemistry, to Medical Class, three times per week from Feb. 1st to March 25th, by Prof. Prescott.

Lectures on Chemical Physics and Inorganic Chemistry, to Junior (Academical) Class, daily from Feb. 12th to May 1st, by Prof. Douglass.

Lectures on Metallurgy, to Senior Mining Engineers, from Feb. 12th to May 1st, by Prof. Prescott.

Lectures on Pharmacy, to the Class in Pharmacy, daily from Jan. 1st to June 15th, by Prof. Prescott.

Lectures on Analytical Chemistry, to the Laboratory Class, twice a week during most of the year, the subject being repeated three times, for students commencing in Laboratory, by Prof. Prescott.

Class Drills, half hour daily, in Chemical Reactions, from Oct. 1st to March 20th, by Dr. Rose.

Class Drills in Toxicology and Urology, twice a week, from Oct. 1st to June 15th, by Dr. Rose.

IV.

REPORT OF MR. A. WINCHELL, PROFESSOR OF GEOLOGY, ZOOLOGY, AND BOTANY.

To the President of the University:

The instruction in the elements of Botany has been given to a class of about two hundred, consisting of the whole body of freshmen and the senior students of the Department of Pharmacy, besides a considerable number from the Sophomore, Junior and Senior classes who had entered the University after the Freshman year, and other students pursuing select courses. In so large a class, very little attention could be paid to individuals. The method pursued has been, to procure each day a supply of living specimens of two (sometimes three) species of plants, placing one specimen of each in the hands of each student. With specimens before them, I have then proceeded to point out such characters as the plant presents, and thus to introduce, and at the same time to illustrate, such technical terms as the plant suggested—dwelling particularly on the more fundamental characters of the natural orders. The class has then been conducted systematically through the analytical tables, to the specific determination. By this means, an expertness has been acquired in a branch of the study very generally omitted in colleges, but which, according to my observation, *must be attained* before a student can feel such an impulse as is at all likely to carry him forward to ulterior attainments. On frequent occasions, remarks have been made, connecting together and generalizing observations, with the special view of developing the laws of vegetable growth, the methods of the science, and the practical applications of its principles. The class has also been required to read a text-book. Under my advice and direction, 24 herbaria have been prepared by students, averaging about 50 species each. The care and intelligence shown by the collectors has been unusually gratifying.

The instruction in Zoölogy has been given to the Scientific Juniors and ten Seniors electing the study, select students, members of the medical, pharmaceutical and law departments, and resident graduates. It has consisted of: 1. A series of familiar lectures and commentaries on topics suggested by the text-books; 2. Formal lectures on classification, structure and biology, illustrated by diagrams; 3. Microscope demonstrations; 4. Work and instruction in the laboratory. The laboratory-work has been carried through the year, and has been participated in chiefly by Seniors and resident graduates. It has consisted largely in the detailed study of specific forms. The outlines of Ornithology, Mammalogy, Ophidology, Ichthyology, Conchology and Entomology have thus been pursued, besides Comparative Osteology and Palæontology. Several students, also, have made special study of the manipulation of microscopes. The material used in the laboratory has consisted of series of specimens in the several classes of animals, selected for the use of students, and, after these, the entire contents of the zoölogical museum, with due restrictions demanded by the safety of the specimens. Most of the work done in the laboratory should properly be ranked as belonging to higher zoölogy.

The instruction in Geology has consisted chiefly of two courses to the Seniors. 1. A course of eight weeks in Lithological Geology, in which most of the time has been devoted to the actual study and discussion of specimens. Our locality is peculiarly rich in lithological varieties, obtained, of course, from northern boulders. After the study of labeled specimens, which are passed around the class for each one's critical inspection, sets of specimens collected by students, are similarly passed, each with its proper label, prepared on the occasion. About two sets, aggregating about 100 specimens, are passed each day. These labeled sets go afterwards into the possession of the collectors, to serve as standards for future use. Fifty of our 86 seniors have thus been provided with small cabinets of labeled specimens. Actual records show that the class of 1872 collected 2,177 lithological specimens, which were thus labeled and left in their hands. Some hundreds were also labeled in the laboratory. In Historical Geology, the instruction has consisted of two courses of lectures—the first, of 21, somewhat familiar and technical; the second, of 14, presenting rather the grand generalizations of the science. These have been illustrated by charts, blackboard diagrams, and specimens. A text-book has also been read. Written exercises of one to four foolscap pages, have been required of the class, on topics assigned; and several elaborate theses have been presented.

It would be an unjustifiable omission should I fail to call your attention, as I have several times called that of your predecessors, to the fact that all this instruction to more than 300 students, (300, the past semester,) in three grand departments of science, has been given by one professor, in addition to his labors upon the Museum; and that anything in the nature of "drill," upon which so much depends in other branches of science and literature, has been quite impracticable, and all its advantages have therefore been lost to this department. There is no need of amplifying upon this suggestion; and I conclude with the expression of renewed hope that the Board of Regents may discover the means of reinforcing my chair in a measure somewhat commensurate with the marvelous growth of our classes, and the generous and appreciative examples set by the best colleges and universities of the country.

V.

REPORT FROM De VOLSON WOOD, PROFESSOR OF CIVIL ENGINEERING.

UNIVERSITY OF MICHIGAN,
June 30th, 1872.

To the President of the University:

SIR,—I respectfully submit the following report of the labors in the Department of Engineering during the past year:

I had no exercises with the Freshman Class. The Scientific Section of the Sophomore Class took up Land Surveying at the beginning of the year, and continued the study for nine consecutive weeks. The class consisted of forty-five students, and was divided into two sections for class-room exercises, and each of these into two more sections for field exercises. I conducted the class-room exercises, which consisted of recitations from Gillespie's Land Surveying and of familiar Lectures upon the subject. The class went over all the subjects of the text-book, with the exception of a few unimportant problems in parting off and dividing up land.

The field exercises were conducted by Prof. J. Burkett Webb, my assistant at that time, who was assisted by Prof. P. R. B. De Pont. The object of these exercises is not to make expert surveyors, but to lay a proper foundation for those who desire to become such, and to teach to all, in a practical way, the principles which are involved. Each student is required to do every part of the work for himself. He uses the axe, chains, carries the flag, uses the compass, the transit, and the theodolite computes his work from his field notes, and makes a plat of it, and reports the result to the Professor in charge. Neatness and accuracy are insisted upon in these reports. The Instructor accompanies the parties in the field, and directs and criticises their work, and teaches them how to perform the several operations which are required of them. There was one lady in the class, who performed all the operations in the field and class-room the same as the gentlemen. Her deportment and scholarship were such as secured for her the respect of all her classmates on all occasions. She was relieved from what might otherwise have been an embarrassment in the field work, by the attendance of her brother, who was in the same class.

Immediately after finishing the subject of Land Surveying, the class took up the subject of Geometrical Drawing, Tinting and Shading, using Warren's Drafting Instruments and Warren's Plane Projection Drawing as text-books. The students are required to work two hours each day in this subject, in the drawing room, under the supervision of the Instructor. As I had no assistant at this time, I was obliged to conduct the exercises. Besides the drawing, they were required to learn the theory, and attend occasional recitations and reviews. This course extended over the second half of the first semester.

During the last half of the second semester, the Scientific and Latin Scientific Sections of the Sophomore Class pursued the subject of Descriptive Geometry (Davies'). The former section was taught during the advance by Prof. Du Pont, and the latter by Instructor Charles H. Denison, who had been secured temporarily as my assistant. I conducted the review and examinations, besides attending the daily recitations frequently. I am pleased to state that both Instructors did their work well. These classes took nearly all the problems to Warped Surfaces.

The Scientific and Latin Scientific Sections of the Junior Class pursued the subjects of Shades and Shadows (Warren's), and of Linear Perspective (Warren's), during the whole of the first semester, excepting the first six weeks, under my immediate supervision. The recitations occupied one hour once a week, and the drawing exercises two hours each day for four days of the week. Nearly all the drawing was done in the drawing room, although some students were permitted to draw in their own rooms during a portion of the time. In addition to the figures in the text-book, they were required to construct the Perspective of objects from measurement, and no one was allowed to pass who could not construct his Thesis correctly and tint and shade it neatly.

During the last half of the second semester, the Latin Scientific Juniors, and such members of the Classical Section as chose it, pursued the subject of Land Surveying, which was pursued to the same extent and in the same way as described above for the Scientific Section of the Sophomore Class. The class was divided into two sections of 17 each. I conducted the exercises in the class room, and Mr. Denison the exercises in the field.

During a portion of the second semester, I gave a Course of Lectures to the Senior and Junior classes in Civil Engineering, on the subject of Mechanical Engineering. My plan has been to combine these classes, and give to them a course of lectures which extends over a portion of two years, alternating the lectures on the successive years. During the past year the lectures were chiefly upon the principles of steam engines of various kinds, but there were a few lectures upon the principles of Designing Machinery, Pattern Making, Moulding, and Shop Work. A part of the course consists in exercises in Machine

Drawing, and the class made working drawings of an invention of my own, from which a working machine has since been constructed.

In the course of these lectures I introduced a novel mode of instruction, in order to exercise their inventive faculties I assigned to them a problem, the character of which I was certain they were not familiar with, and asked them to solve it, make a drawing to represent their idea, accompany it with a specification, and report it to me. As soon as all had solved it who were able to, I reviewed their solutions and criticised them before the class, indicating the valuable points as well as the objectionable features. The following may serve as an example:— After describing the construction and operation of the ordinary D valve, and showing particularly that in order to open a port so as to reverse the stroke of the piston, the valve, up to the point of opening the port, is moving in the opposite direction from the piston, I asked the class *to invent such an arrangement of parts as that the valve would open the port correctly if it moved the same way as the piston.* In this way nearly all the working parts of the steam engine were considered, and problems assigned which involved modifications. The problems were simple, and were intended as a means of instruction, and not as puzzles. In their solution they not only became familiar with what exists, but also learned other possible ways of accomplishing the same end, and in connection with the criticisms, learned why a particular combination was used. In a class of thirty there would often be fifteen or twenty different solutions; but sometimes there would not be more than five or six different ones. The Class also read all that part of Warren's "Machine Construction Drawing" which pertained especially to the steam engine.

After Class Day the Juniors took up Railroad Surveying.

At the beginning of the year the Senior class in Civil Engineering began the theory and practice of the construction of Roads and Railroads, using Henck's Field-Book for Engineers and Gillespie's Roads and Railroads. I also gave a course of Lectures upon the construction of engineering instruments, and the modes of adjusting them, and upon numerous subjects connected with the construction of roads and railroads. The students are not only required to use the instruments in the field, but also to adjust them. They are required to do all the preliminary work of laying out a railroad. They begin with a reconnoissance, then they survey the line, locating it, re-survey it, take the levels and establish a grade, set the side stakes, compute cuts and fills, and make a finished map of the line including the profile. Following these was a course of instruction upon the Resistance of Materials (using my own work as a text-book) and a course of lectures upon the Theory of Bridge Construction; the Theory of Hydraulic Motors; the

Theory of the Distribution of Water in cities and other Mechanical problems. I have sought to be as thorough and critical in my Lectures upon Bridges as time would permit, not only on account of the vast importance of the subject at the present day, but also on account of the discipline which the students will derive from such a treatment of the subject, enabling them to manage more successfully the numerous mechanical problems which they will inevitably meet in their practice, but which it is impossible to anticipate.

The lecture system, however, is a comparatively slow one, and I would not resort to it exclusively in the treatment of any topic if I could find satisfactory text-books upon it. The most satisfactory way is to use a good text-book for the greater part of the work, and then criticise, approve and expand upon its contents by familiar lectures. But at the present day the information sought is often scattered throughout many books which would cost a large sum to purchase. I have, therefore, in this particular part of the course preferred to lecture, endeavoring thereby to develop a systematic course, and interest the student in reading references. In this way the students become familiar with many authors.

By consulting with the librarian, I find that there had been a large amount of reading in the library in connection with these references.

But partly with a view to facilitate instruction in this line, and partly to add something to this class of literature that will be profitable to others, I am preparing my lectures upon Bridges and Roofs for publication, and I trust that they will be ready for use early next year.

I have also given a course of about thirty lectures to one student on Mining Engineering. This course pertained to those engineering operations which are necessary in the process of mining, and was intended, in addition to the course in civil engineering, to cover all the ground that is necessary in order to enable the engineer to conduct such operations in a scientific manner.

The instruction in Metallurgy and Assaying is given in another department.

My labors the past year have been unusually onerous, not only on account of the great variety of the subjects of which I have had charge, but also on account of the many hours which I had to spend in the class room in order that the classes should not suffer for want of proper attention. During five months of the year I had no assistance excepting three weeks during which time Mr. J. B. Davis, of the class of 1868, taught a few classes.

It was a source of regret to me and to several others, that the active opposition by one who had no personal interest in the matter on technical grounds only, resulted in defeating the appointment as Assistant Professor of Civil Engineering of so competent and mature a man as Prof. Webb. He left early in the year to take the Professorship of Civil Engineering in the Industrial University of Illinois. The result of this action, the manner in which it was secured, and the consequences which followed, determined my future course.

I have thus closed fifteen years of continuous labor in the University, and have seen my own department grow gradually in numbers and strength from year to year; but it falls far below what it ought to be in every respect. I have stated some of its wants in a special report upon this subject. The large and commodious rooms which will be provided in the new building, and the ample assistance which is now provided for the coming year furnish some advantages which have not been heretofore possessed. According to present indications the next graduating class in Civil Engineering will be larger than any that we have ever had.

VI.

REPORT OF MR. J. C. WATSON, PROFESSOR OF ASTRONOMY AND DIRECTOR OF THE OBSERVATORY.

To the President of the University:

In reply to your request for information in regard to the work done in my department during the past year, I have the honor to submit the following statement:

I have given instruction daily during the entire year, to a class, composed of Seniors and resident graduates, in Theoretical Astronomy. During the second semester I have given the usual instruction to the entire Junior Class in Descriptive and Physical Astronomy, and to the Engineering Class in Practical Astronomy, and in addition to this, daily instruction in Mathematical Astronomy to a class composed of Juniors who have elected this study.

My work at the Observatory has consisted, in addition to the usual routine observations, in the continuation of the observations of small stars near the ecliptic, upon which I have been engaged for many years. These observations have resulted, during the past year, in the discovery of three new planets, situated between Mars and Jupiter, as follows:

The first was discovered on the 6th of August, 1871, and I have selected for it the name *Thyra*, from the Scandinavian mythology, and in honor of the King of Denmark, a member of whose family bears the same name.

The second was discovered on the 3d of April, 1872, and the third on the 12th of May, 1872. I have not yet selected names for these planets, and in doing so I shall endeavor, if possible, to make a selection from the mythology of the North American Indians.

These discoveries have been confirmed at other observatories, both in this country and in Europe.

My work upon the Lunar Theory has progressed well during the year. Messrs. Kintner, Edgerton, Burton, Ritter, Baker, and Chute, all graduates of the University, have been engaged in computations, under my direction, the expense of which has been defrayed by the United States Coast Survey.

All of which is respectfully submitted.

VII.

REPORT OF MR. EDWARD OLNEY, PROFESSOR OF MATHEMATICS.

To the President of the University:

SIR,—At your request, I hereby submit a brief statement concerning the department of *Pure Mathematics* in the University, during the past year.

The instructors in this department have been, in addition to the Professor in charge, two instructors the entire year, and one for 25 weeks.

About 230 students (including those received on diplomas from accepted schools, and those for advanced classes,) have been examined for admission. I do not know the exact number rejected, but it is somewhat less than the difference between this number and the number of Freshmen reported in the Calendar (168), as 15 or 20 have been passed into higher classes.

Instruction has been given to the entire Freshman Class (168 students), in Algebra and Geometry, and to the Scientific section in Trigonometry; to the entire Sophomore Class (97 students), in Trigonometry, the Scientific section taking only Spherical; to all of this class in General (Analytical) Geometry, and to 16 Scientific students and 40 Latin and Scientific, in the Calculus. Twenty-five Junior Civil Engineers have received instruction in the higher General Geometry and Calculus, and several resident graduates have also pursued these topics. There have therefore been 290 students in all who have received instruction in this department during the year.

The Freshmen were divided into 8 sections, for daily class drill under two instructors. These sections were met by myself about once each week, for review and careful examination upon the work of the week. At these reviews, two sections were combined into one.

The work in the Classical and Latin and Scientific sections of the Sophomore Class, was done for the first semester much as in the Freshman Class. There were three sections for daily class drill, under an instructor, the work being reviewed by myself weekly.

The Scientific section of the Sophomore Class, and 40 students from the Classical and Latin and Scientific sections electing Calculus, as well as the Junior Civil Engineers, have been under my own instruction.

This plan of work was new. It devolved much more labor and responsibility upon the head of the department, but it also secured more uniformity of method, better personal acquaintance, on my own part, with all the members of these classes, and far more class exercise of each pupil. It has worked to my entire satisfaction thus far. I am confident that though we have always been exceedingly fortunate in the character of the instructors secured for the Freshman Class in Mathematics, the work has never been better done than this year. True, there were more than the ordinary proportion of "conditioned" students at the semi-annual examinations. But this by no means signified a lower grade of attainment in the class. This has never been higher.

I trust the plan will be continued, and ask the continuance of the same instructors for the Freshman Class, at the same rates. For the Sophomore work, I would recommend that Prof. I. N. Demmon be secured for the entire year. The increased number of students in the Sophomore Class will demand this, and will also demand that some change in the order of studies be effected, so as to distribute the labor in my department more uniformly through the year. As it now is, all the instructors are overworked for the first two-thirds of the year, and have not full work the last part. I think this can be easily remedied, and that with three instructors, as above, the work can be done with increasing satisfaction to all concerned.

VIII.

REPORT OF MR. C. K. ADAMS, PROFESSOR OF HISTORY.

To the President of the University:

SIR,—On the study of History as pursued in the University during the past year, I beg leave to present the following report:

I. AMOUNT OF TIME DEVOTED TO THE STUDY.

To students of the Freshman Class in the Classical Department, instruction has been given in Ancient History by the Professors of Greek and Latin. This instruction has amounted to one lesson per week during the whole of the freshman year. The text-books used have been Smith's History of Greece, and Liddell's History of Rome, and the periods to which the study has been devoted embrace Grecian History from the First Olympiad to the end of the Peloponesian War, and Roman History from the foundation of the city the First Punic War. Students of the Latin and Scientific Course have pursued Roman History only. The historical studies of the *Scientific Section* of the Freshman Class were pursued under the direction of the Professor of History. To this work the Class devoted one daily lesson during the first semester. The period studied embraced the history of the Asiatic nations and of Greece and Rome to the Fall of the Western Empire, Rawlinson's Manual of Ancient History being the text-book used.

In the second semester of the Sophomore year, Classical students and Latin and Scientific students have the option of studying Calculus or Modern History. About one-half of the Class of the current year elected the latter, and pursued the history of Europe from the beginning of the Reformation to the death of Queen Anne. To this work twelve weeks were devoted, the Class having five lessons per week. The Scientific section of the same Class also had Modern History during half of the second semester.

In the course of the Junior year an attempt is made to acquaint the student with the more difficult period of Mediæval History, and with the Philosophy of History. The books relied upon for this purpose are chiefly Hallam's Middle Ages, and Guizot's History of Civilization. All the members of the present Junior Class, with the exception of students of Civil Engineering, have devoted to this work five lessons per week during six weeks of the first semester, and during nine weeks of the second semester.

In the Senior year the historical studies are for the most part elective. The only work *required* is of students of the Scientific and of the Latin and Scientific courses, during two-fifths of the second semester. This time is devoted to a study of the Constitutional History of the United States. In addition to this, there is an opportunity to continue the study by electing it for the remainder of the semester. During the whole of the first semester, history is also offered as an elective study to students of all the courses. Members of the present Senior Class who elected history, devoted the first semester to the study of English Constitutional History, and the second to the Constitution of the United States in comparison with the most important political Constitutions of ancient and modern nations.

The following table will show, in the way of summation, the amount of history which is required, as well as the amount which may be elected. The figures indicate the number of lectures and recitations:

	Cl. Course.		Sc. Course.		L. & Sc. Course.		Civ. Eng. Course.	
	Required.	Optional.	Required.	Optional.	Required.	Optional.	Required.	Optional.
Freshman Year, . .	36	36	90	90	18	18	90	90
Sophomore " . .	00	60	45	45	00	60	45	45
Junior " . . .	75	75	30	30	30	75	00	00
Senior " . .	00	180	35	180	35	180	00	90
Total in Courses, . .	111	351	200	345	83	333	135	225

II. Amount of Time given to the work of Instruction.

The size of the classes now in the University, and the present arrangement of historical studies, demand that the work of instruction shall be divided as follows:

First Semester. Seniors in four divisions, each division having two exercises of one hour each per week. Juniors in two divisions, each division having one exercise per day during six weeks. Freshmen in two divisions, each division having one daily exercise during the whole of the semester.

Second Semester. Seniors, (Scientific, and Latin and Scientific sections,) one daily exercise two-fifths of the semester. Other members of the same Class arranged in four divisions, each division having two hours per week. Junior Class in two divisions, during one-half of the semester, each division having a daily exercise. Sophomore Class, (Scientific section,) one daily exercise during half the semester. Members of the same Class (Classical and Latin and Scientific Courses) electing history, one daily exercise during twelve weeks.

Thus the amount of instruction demanded by the present arrangement of historical studies, and by the present size of our classes, is somewhat more than four hours per day during the entire year. I need hardly call your attention to the fact that it is impossible for a single officer to fulfil these demands. The impossibility becomes more apparent when it is observed that the courses of instruction embrace ancient history as well as modern, constitutional history as well as political, and that a very considerable portion of the instruction, especially to the higher classes, must be given in the form of lectures. The services of an assistant, therefore, who can give to the work of instruction in history at least two hours per day, I deem indispensable to the future interests of students pursuing historical studies.

III. CHANGES INTRODUCED DURING THE YEAR.

Ever since my observation of the methods pursued in Europe, I have desired to introduce into the historical courses of the University of Michigan something akin to the *Historische Gesellschaft* of the German universities. At the beginning of the past year a favorable opportunity seemed to present itself. After consultation with the President of the University, and with the Faculty of our Department, I met the members of the Senior Class and explained the purpose of the experiment. It was found that twenty-seven members of the Class desired to take an extended course of historical study, even in addition to the regular work of the senior year. After this expression the Faculty decided to place history among the elective studies.

It was determined that the work of the semester should be devoted to the study of the Growth of the British Constitution. Twelve questions, embracing topics of most importance from the period of the Saxons to the Reform of 1832, were given to the Class, together with numerous references to the best authorittes in the University Library. The Class was divided into sections of from six to ten members each, in order that the work of each member might, as far as possible, be under the direction of the Professor. Each section came together once a week for a session of two hours, when one of the members was required to read a carefully prepared essay on the question before them, and each of the other members was called upon to give the results of his own study of the same subject. In this manner the Class gained a good knowledge of the leading events in the growth of the English Constitution, and, what was perhaps of scarcely less importance, acquired a more or less intimate acquaintance with the best works that have been written on the civil and political history of the Anglo-Saxon race.

In the second semester the same course was pursued in studying the constitutional history of our own country. The topics assigned embraced not only the Constitution of the United States, but also a comparison of its chief characteristics with those of other leading political constitutions. both ancient and modern. These discussions, of course, took the Class into a somewhat general study of the fundamental principles of political philosophy.

The success of the experiment was greater than could have been anticipated. The enthusiasm of the students, in investigating the various subjects assigned was worthy of all commendation. I have no hesitation in saying that of the historical work done in the University under my direction, that of the graduating class, pursued in the method described, has been the most satisfactory. Though the organization of the Class has added very largely to the amount of instruction demanded, I cannot but think that the enthusiasm and the success with which the historical studies of the year have been pursued, fully demonstrate the practicability and the wisdom of this method of instruction.

IX.

REPORT OF MR. M. C. TYLER, PROFESSOR OF THE ENGLISH LANGUAGE AND LITERATURE.

To the President of the University:

SIR:—I have the honor to present to you the following report for the Department of the English Language and Literature during the year 1871–2:

I. THE ENGLISH LANGUAGE.

This study was pursued during the first twelve weeks of the second semester by the scientific section of the Freshman Class, with whom, also, were several Sophomores, select students, and members of the Law Department. The great object in view in the instruction given was to develop in the students a loyalty to our own language, and an ambition to be accurate in the use of it; and then to show them exactly what they were to do in order to acquire this accuracy. It may, indeed, seem a humble task for the University to be engaged in, when I report that the study referred to grapples with those lowly topics which properly belong to the common school, namely, spelling, pronunciation, etymology, syntax and punctuation. Certainly, it would be agreeable to me were I able to take for granted a universal acquaintance with these elementary subjects, and to direct my classes into the higher fields of English philology. I have thought it best to be guided by actual facts rather than by ambitious wishes, and to select the topics in this study according to the real needs of the students themselves. The lectures were conversational in style. The students took in the lecture room copious notes, which they afterwards copied carefully into books; and these books were submitted for my inspection at the final examination. There was, also, each day an examination on the preceding lecture. Moreover, the members of the class aided me in bringing forward examples for criticism under the several topics discussed; and great interest was manifested by the students in these criticisms, in which they were encouraged to take part freely.

The lectures and lessons in this course were 45 in number.

II. ENGLISH LITERATURE.

The lectures upon this subject were attended by the entire Sophomore Class, by seven members of the Junior Class, by several students pursuing selected studies, and by a few members of the Law Department; and the lecture room was always so crowded as to be rather uncomfortable.

Ten lectures were given upon the fourteenth century, nine upon the fifteenth century, and four upon the sixteenth century; and upon these lectures twelve separate recitations were held. The time occupied was the last half of the Second Semester.

I am far from satisfied with any method yet hit upon for teaching English Literature to students like ours. Perhaps the most serious difficulty grows out of the vastness of English Literature, the multiplicity of the facts—historical, biographical and bibliographical—which are involved in it, and the difficulty of interesting young people in critical estimates of books which they have never before seen or even heard of. When it is considered that English Literature means the literature of the English-speaking race, and includes (a) the literature of England for six centuries, (b) the literature of Scotland for six centuries, (c) the literature of Ireland for at least two centuries, (d) the literature of America for three centuries, and (e) the literature of Canada, Australia and other British dependencies for periods varying from half a century to a century and a half, it becomes evident that a scholarly inspection of the whole territory of

English Literature is impossible in the time allotted to this study in the University; and that the only course to be taken lies in the choice of some section of this vast domain, and in concentrating attention upon that. The section chosen by me this year was the fourteenth, fifteenth and sixteenth centuries of the literature of England.

It is my intention next year to take up, in a similar manner, the literature of America, and perhaps to shift the field of view with each succeeding class.

As to the method of instruction in English Literature, I have anxiously considered the question as between teaching by formal lectures and teaching by a text-book, and have hitherto inclined to the former plan. If I were able to receive the students in this work at a later period of their course, when they had attained more intellectual discipline, more literary culture, and more knowledge of history and of books, I should have no doubt about the wisdom of this preference. I have at times this year been disturbed by the presence at my lectures of a few persons apparently without any appreciation of the literary qualities of any author who could be brought under notice, and as yet quite unqualified for instruction in any other form than that of the primary school. Yet I must also acknowledge that in the course just given I have been cheered by manifestations of great interest on the part of the majority of my large class, by their polite and steady attention, by their zeal and accuracy in taking notes and in transcribing them afterwards with greater fulness, and in the excellence of their preparation for the recitations upon the lectures, and for the final examination.

All that can be hoped for in this study is to give our students a good start; and that signifies not only some knowledge of the subject, but the awakening of a real love for it. I trust that something worth the while has been done in this direction this year.

I append a copy of the examination paper just used in English Literature:

1. Reasons for beginning the history of English Literature with Chaucer.

2. The Vision of Piers Ploughman: its author and his life: its poetic form: its plan.

3. John Gower: the facts of his life: his learning: the names of his three large works.

4 Chaucer: the two principal biographies of him: sketch of his life: his several prose works: classification of his poetical works: plan of the Canterbury Tales: on what historical event the pilgrimage to Canterbury was founded.

5. The three languages in use in Chaucer's time: names of his literary contemporaries.

6. The fifteenth century as a literary period: how the prevalent disparagement of it is accounted for: facts significant of its intellectual tendencies.

7. John Lydgate: facts of his life: his personal character and mental traits: his three principal poems.

8. The old English Ballads: how they have been collected, and by whom: how they may be classified: their value as historical material.

9. Reasons for the neglect into which the poetry of the fifteenth century has fallen.

10. Wherein its prose is superior to that of the fourteenth century.

11. Bishop Reginald Pecock: the facts of his life: his principal work: characteristics of his style.

12. Names of the principal poets and prose writers of the 15th century.

13. The Elizabethan era: what literary forms it originated: the discreditable characteristics of this era.

14. Edmund Spenser: his life: the name and plan of his principal poem.

III. RHETORIC.

This study, in which the instruction was given by lectures, and with nearly the same students as have been just referred to, occupied the first half of the Second Semester. The number of lectures given was 31.

IV. ELOCUTION.

Lectures upon this subject, accompanied by exercises with the class, were given to the classical section of the Freshman Class during three weeks of the First Semester. Three lectures were given each week. As many lectures were given in the Second Semester to the scientific section of the Freshman Class.

Besides these lectures on Elocution, elocutionary training, in the form of lessons, was given to the gentlemen appointed to speak at Junior Exhibition. Eight lessons were given. For a similar object, six lessons were given to the speakers for Commencement. In the case of the latter, many laborious hours have also been spent in the private rehearsal of their speeches.

V. EXERCISES IN SPEAKING AND WRITING.

The care of these exercises is the most delicate and fatiguing task that is entrusted to me. The following items may give some idea of the work actually performed:

The Sophomore Class presented, First Semester,	93 essays.
“ “ “ “ Second “	89 “
Total,	182 essays.
The Junior Class presented, First Semester.	75 speeches.
“ “ “ “ Second “	76 “
Total,	151 speeches.
Total number of essays and speeches for the year,	333

The essays are read, and the speeches delivered from memory; and copies of each, carefully prepared, are left with me for inspection. During the First Semester, I was able to deal thoroughly with this work of revision and criticism, and far more time was spent with the students in criticising privately their productions than was occupied in their public delivery.

In the Second Semester, my work in other directions was so great that I was not able to give any time to this very important office of private criticism.

In the Senior Class a very successful experiment was made during the year, for the cultivation of extemporaneous speaking. In place of the melancholy and futile exercise of speaking in the chapel, in which the Seniors have hitherto engaged under compulsion, there was presented to them the plan of a voluntary association, to meet once a week, to be presided over by the Professor of English, and to engage in the extemporaneous discussion of questions, each of which should be selected one week in advance of its treatment. About forty members of the Senior Class have engaged in this association with a heartiness, a vigor, and a success increasing to the end of the year.

In conclusion, I have the happiness to state that the work done in my department during the past year has been, upon the whole, far more satisfactory to me in its progress, and far more fruitful in wholesome results, than ever before since my connection with it.

To yourself, sir, I beg leave to express my gratitude for the counsels and the appreciative sympathy with which you have aided me in the difficulties which I have encountered.

X

REPORT OF B. F. COCKER, PROFESSOR OF MORAL AND MENTAL PHILOSOPHY.

To the President of the University:

The Professor of Moral and Mental Philosophy has had in charge the following studies:

I. Social Science, with the Scientific Juniors for ½ the Semester. In this class he has had 13 students belonging to the regular Scientific course; 5 Seniors, with whom it was optional, and some Law Students, who had permission from the Faculty to attend.

II. Metaphysics. History of Philosophy; Applied Logic, and Evidences of Christianity, with the Senior Class.

In this class he has had present 85 Seniors, besides a number of Law Students who had permission from the Faculty to attend.

The professor has felt himself embarrassed by the number of studies crowded into the senior year, some of which really demanded the whole time for a thorough and adequate grounding therein. Under these circumstances he has pursued a course which in his judgment seemed for the best interests of the class. Regarding Psychology as the fundamental study, inasmuch as it deals with the mental principles and laws which underlie Logic and Ethics: he has devoted the whole of the first semester to this study alone, and endeavored to do the work thoroughly. The second semester has then been devoted to History of Philosophy, Applied Logic, and Ethics, together with the bearing of these studies on the Evidences of Christianity. The Evidences of Christianity have been the subject of discussion in the Sunday afternoon lectures, and he hopes this may be accepted as an excuse for the small attention devoted to the subject in the class.

The professor regrets that he has not found a text-book on Metaphysics which he can use in his class with full satisfaction, and has found it necessary to do much of the work by Lectures. Should his life be spared he hopes to prepare a text-book which in his judgment will be better suited to his purpose. Meantime he would be gratified if it could be arranged so that, for the first semester, he might have TWO hours per day with the class. One hour, say at 3 or 4 P. M. for lecture, and another hour, say at 9½ A. M. for examination and thorough drill.

The growing importance of Social Science, the vastness of the literature of the subject, and the fact that we have in our possession the library of Prof. Rau, in which most that has been written on this great theory, in the languages of Europe, is happily found, render it desirable that the subject should now receive more attention in the University courses, (and especially in the senior year), and he feels it best that he should be excused from this department of work.

XI

REPORT OF GEORGE S. MORRIS, PROFESSOR OF MODERN LANGUAGES AND LITERATURE.

To the President of the University :

In accordance with your request, I beg leave to offer the following statement of the work done in the department of Modern Languages :

Instruction has been furnished in French, German, and Italian. In this work three instructors, beside the undersigned, have been, with one exception, wholly employed. The whole number of hours of instruction given has been (about) 1855.

I. *French.* All of the Scientific and Latin-Scientific students have been instructed in French during the whole year, in four sections, by Messieurs J. F. Billard (three sections) and P. R. B. De Pont (one section, Scientific students). One of the sections, made up of Scientific and Latin-Scientific students who had previously studied French, formed an advanced class. These sections beginning French have used Fasquelle's French Course and Pylodet's Litterature Française Contemporaine. The main work done with them has, of course, been largely elementary—the learning of French pronunciation and the substance of French Grammar, as also the translation of easy French, and exercises in French composition. The advanced section have also translated thirteen pages of Sadler's English into French.

The Latin-Scientific sophomores read during the first semester Voltaire's Mérope and Molières L'Avare, besides studying Poitevin's Grammaire Complète and translating from Borel's Cours de Thèmes (English into French). The Scientific Sophomores used also the two latter works and read Achard's Le Clos-prommier, in the first semester, and Corneille's Le Menteur in the first half of the second semester. Both sections wrote compositions in French at stated periods, and French was made largely the language of question and answer in the recitation room. Each section recited three times in each week to the undersigned, and twice to Monsieur Billard.

The Classical section of the Junior class began French in two sections at the beginning of the year, under Monsieur De Pont, who continued to instruct them until the middle of the second semester, using Knapp's French Grammar, in the first semester, and Knapp's Reading-Book. The class went through most of the grammar and the corresponding exercises, and were in the second semester, studying Murice-Poiterin's Grammaire Française and translating Sadler's English into French when they passed under the instruction of the undersigned. They have since continued the same work, beside reading Voltaire's Zaïre and writing three compositions in French—French being also almost exclusively the language of the recitation-room. During the first part of the second semester, Corneille's Le Menteur was read with a voluntary and irregular class of Seniors and Juniors. They had some twenty-five or thirty recitations, heard partly by M. De Pont, but mostly by the undersigned.

II. *German.* The number of classes has been five : the Latin-Scientific and some scientific Juniors (commencing) during the whole year, an advanced class of Seniors in the same courses (elective), a class of Classical Seniors (also elective, in two sections) and, since May 1, a class of Classical Juniors (elective). Whitney's German Grammar, exercises, and Reader have been used with students beginning German. Much, and almost exclusive, use has been made of German, especially with advanced classes. Especial attention has been directed from the outset to the learning of German idioms, as well as the laws of grammatical change and construction. The advanced class of Seniors read Schiller's Wilhelm Tell and the first book of Schiller's Thirty Years War, had two lessons each week in translating from English into German, and wrote three compositions and one historical essay, each, in German. The Classical Seniors read during the last seven weeks of their course five cantos of Gœthe's Hermann and Dorothea, had frequent lessons in translating English into German, and wrote compositions in German, All classes in German have been instructed by Mr. Robert Harbison, except the advanced Seniors during three-fourths of the year, and the Classical Seniors during one-fourth.

With all of the more advanced classes, both in French and in German, it may be added that the attempt has been made, whenever masterpieces of foreign literature were being read, to call attention to the peculiarities of the style and of artistic construction, and to supply or elicit such historical information as was necessary to a fair appreciation of the works in hand. Constant practice in original French or German expression has been required, on the basis of words or phrases occurring in the reading-lessons. During the second semester five hours were occupied by the undersigned in presenting to the Junior and Sophomore sections an outline of the history of French literature, and six hours in giving a similar outline relative to German literature to the Senior sections studying German. In all cases the students are required to take notes of the lectures and to present the same written out in proper form at examination.

French-speaking societies were voluntarily formed among the Freshman students, and for a short time a German conversation club was maintained among the Seniors. Each of the instructors assisted at the meetings of those societies which were formed from among his own classes.

III. *Italian.* Two lessons per week during the second semester were offered by the undersigned, with the permission of the Faculty, to such members of the Senior and Junior classes as desired to elect Italian. An excellent class (of sixteen persons) was formed, and the greater part of Cuore's Italian Grammar was learned, and about fifteen pages of Italian were read.

In general, all the classes in the department have worked well, with honest interest. Owing, in large measure, to the painstaking and intelligent labors of the three gentlemen named as instructors in this report, it is believed the department has made a decided advance during the past year in point of thoroughness and extent of the work done. The requirement of a certain knowlege of French on the part of Latin-Scientific and (in 1873) of Scientific students entering the University, will doubtless render it possible to secure still more satisfactory results with those students in French.

XII.

REPORT OF ELISHA JONES, ACTING PROFESSOR OF THE GREEK LANGUAGE AND LITERATURE.

To the President of the University :

The following report of the Greek Department for the Academic year 1871-2 is respectfully submitted.

The whole number of students belonging to the department at the beginning of the year was 201, divided as follows : Seniors, 59, Juniors 37, Sophomores 44, Freshman 61. In the first semester eleven Freshmen and one Sophomore were found unable to remain in their classes, and two additional Sophomores and one Senior were admitted, making the whole number belonging at close of year 192.

The following work was done by the different classes:

The Freshman Class had five recitations a week during the whole year. This class was divided according to scholarship. In the first semester the first division read all of the Panegyric Oration of Isocrates, and the second division the first forty-four pages (Felton's edition). Both divisions had two lessons each week in Boise's Prose Composition, and reviewed Parts I. and II. of Hadley's Grammar.

During the second semester the class read of Thucydides Book I. from Chapter 22 through, omitting the speeches. and Book II. first 46 chapters including the speeches. Part IV of Grammar, and Grecian history from first Olympiad to end of Peloponnesian War were also learned. A most careful criticism of the text accompanied the reading of both Isocrates and Thucydides.

The plan of dividing according to scholarship has, in the opinion of the instructor, worked well. Those in the second division were stimulated by the hope of gaining admission to the first, and those in first were ambitious to maintain their position; while no jealousy or unfriendly feeling was provoked among the different members of the class.'

The Sophomore Class was also divided during the first semester according to scholarship. The class had one recitation a week in Smith's History of Greece, and four in Homer's Iliad. In the history all chapters on the Heroic Age, and on Literature and Art to the close of the 5th century B. C., were learned. Of the Iliad, the first division read the first six books and the second the first five. In addition to the translation, special attention was given to the dialect of Homer, to its peculiarities in contrast with the Attic; the beauties and characteristics of the Iliad and its value in history were made prominent; the "Homeric Question" was discussed, and essays on subjects connected with the age of Homer were written and read by each member of the class.

In the second semester the class had 45 recitations and read most of the Electra of Sophocles. Each student also prepared and read a critical essay on some great tragedy or comedy. The History of the Greek Drama, its origin, rise, and characteristic features; description of the Grecian theatre; the lives and labors of the three great Attic tragedians, were prominent topics in the oral instruction.

The Junior Class in 50 recitations read Demosthenes' Oration on the Crown. Essays were required from each student on subjects connected with the time of Demosthenes. In addition to textual criticism the oral instruction sought to make the class acquainted with the political institutions of the Athenian Republic, and with the chain of events in the 4th century B. C., that led to the Macedonian supremacy and final overthrow of the Grecian independence.

The Senior Class had seven weeks of five recitations each and read Plato's Apology and Crito. Lectures were given the class on Education at Athens in the time of Socrates and Plato.

XIII.

REPORT OF THE INSTRUCTION IN PHYSICS.

Adjunct Professor Merriman being absent at the time these reports are presented to the President, the following brief statement alone of the work in Physics is presented :

All the Junior class study Physics during the entire first semester, taking the following topics : Physics of Solids, Liquids, Gases, Acoustics, Light and Meteorology.

The students of the Junior year take during the entire second semester Analytical Mechanics, embracing the application of the calculus.

XIV.

REPORT OF EDWARD L. WALTER, ASSISTANT PROFESSOR OF LATIN.

To the President of the University:

In accordance with your request, I beg leave to submit the following report of the work done in the department of Latin during the year just closing.

For the last ten weeks of the first semester, the Classical and Latin and Scientific Seniors recited to me five lessons a week. The size of the class, (something over sixty), made it necessary to divide it into two sections. They read and reviewed the Germania and Agricola of Tacitus, and accomplished the work in a manner generally very satisfactory.

During the first twelve weeks of the second semester, the Juniors, Classical. and Latin and Scientific, recited to me in two sections five times a week. They read the tenth Book of Quintilian's Institutions, I think thoroughly and well.

In the first semester, the Sophomores recited in daily exercises in Horace. They read about two books of the Odes, six or eight of the

Satires, and the *Ars Poetica.* They were drilled in Prosody, and became familiar with the more frequently-recurring metres.

In the second semester they recited to me in daily exercises for the first half of the semester in Terence. The first section read the Heautontimorumenos, the second the Phormio. Considerable attention was given to the derivation of words and to the history of the language, both in form and construction, so far as illustrated by the text of the author they were reading. Each student also read an essay on a subject assigned, connected with the study of the year in Latin.

The Freshman Class recited in three divisions to Instructor F. A. Blackburn, one Latin and Scientific, and two Classical. They have had daily exercises throughout the year. During the first semester they read Cicero De Amicitia, and completed the third part of Harkness' Latin Prose Composition. In connection with the reading, they reviewed the Etymology. They were required to write the exercises in Latin Prose, and to hand in a corrected copy for examination.

During the second semester, they read the twenty-first Book of Livy and studied the History of Rome down to the third Samnite War, reciting in History once a week. They reviewed the Syntax, and were thoroughly drilled in its application.

For the first time with me the experiment was tried of determining the division of classes on the basis of scholarship instead of the letters of the alphabet, and the experiment seems to me, so far, an undoubted success. The Sophomore Class, the only class reciting to myself in which the experiment was tried, has done as good work with me this year as ever was done by any sophomore class. The division was continued only during the first semester, owing chiefly to the increasing difficulty of making a satisfactory division, arising from the rapid improvement of most of the members of the second division.

Instructor Blackburn presents a similar report from the Freshman Class. The satisfactory character of the work, especially noticeable in the two lower classes, is in my judgment to be attributed largely to the new method of division.

In conclusion, I would like to express my personal obligations for the kindness and consideration uniformly received by me from yourself and from my older and more experienced colleagues in the Faculty. No one is more keenly conscious than I of the wide difference between myself and the accomplished scholar and gentleman whose chair I temporarily fill; but this difference has not been increased by lack of diligence on my own part, nor by lack of consideration on the part of others.

PRESIDENT'S ANNUAL REPORT.

To the Honorable, the Board of Regents:

I have the honor to lay before you my report for the year, which ended on June 26, 1873.

More changes than usual have occurred in our corps of Professors. Immediately after Commencement in 1872, De Volson Wood, M. A., Professor of Civil Engineering, resigned his place to accept a chair in the Stevens Institute of Technology, Hoboken, N. J. A few weeks later, Alexander Winchell, LL.D., announced his intention of resigning the chair of Geology, Zoology and Botany in January, 1873, to accept the office of Chancellor of the Syracuse University. He kindly consented, however, to remain till near the close of the first semester, to complete the full course of instruction in Geology. In January, 1873, Moses Coit Tyler, M. A., resigned the chair of Rhetoric and English Literature, to engage in editorial work in New York. He had been a member of the Faculty six years, Mr. Wood thirteen years, and Dr. Winchell nineteen years. They had all rendered most valuable service to the University, and it was with regret that their associates and their pupils saw them depart for their fields of labor.

The following gentlemen were appointed at the end of last year, or at the beginning of this year:

Charles E. Greene, M. A., C. E., Professor of Civil Engineering. Donald Maclean, M. D., Lecturer on Surgery. Joseph B. Davis, C. E., Assistant Professor of Civil Engineering. Charles S. Denison, C. E., Instructor in Engineering and Drawing. Isaac N. Demmon, M. A., Instructor in Mathematics. Harry B. Hutchins, Ph. B., Instructor in History and Rhetoric. Alfred Hennequin, B. A., Instructor in French.

GENERAL LIBRARY UNIVERSITY OF MICHIGAN

In February, 1873, Mr. Leslie Irving was employed to give instruction during the second semester in Rhetoric and English Literature. Prof. D'Ooge, who had been in Europe two years, returned to his post at the beginning of the year; and Mr. Harrington, Instructor in Geology, Zoölogy and Botany, returned from Alaska in January. Dr. Frieze has been absent by permission, in Europe. Marcus Baker, M. A., Instructor in Mathematics, resigned his post in March, to accept the place of astronomer to a government expedition to Alaska. Robert Harbison, M. A., who has for two years been a most efficient Instructor in German, resigned his work in June.

The following gentlemen were appointed in June last:

Eugene W. Hilgard, Ph. D., Professor of Geology, Zoölogy and Botany. Frank A. Scott, M. A., Instructor in German. T. L. Gilpatrick, M. A., Instructor in Mathematics.

The whole number in our Faculties of instruction has been forty, two more than in the previous year.

THE NUMBER OF STUDENTS.

When the Calendar was printed, the total number of students present was 1,163. Thirteen entered afterwards. The total attendance during the year was 1,176, as follows:

Department of Literature, Science and the Arts.

Resident Graduates,	9
Seniors,	78
Juniors,	72
Sophomores,	121
Freshmen,	122
In Selected Studies,	34
In Pharmacy,	48
Total,	484

Department of Medicine.

Students,	358

Department of Law.

Seniors, 122; Juniors, 212; total,	334
Total in University,	1,176

The total attendance was not quite so large as it was in the preceding year. There was a slight increase in the number in the Medical Department, but a little decline in the other Departments. With our large numbers slight fluctuations are to be expected. Probably the continued elevation of our standard of admission not only cuts off, on examination, a considerable proportion of applicants, but also deters many others from applying for examination. When we consider how Medical and Law schools are multiplying in the West, it is somewhat surprising that the attendance upon our professional schools is so well maintained.

The proportion of Michigan students to the whole number varies very little from year to year. Of the total attendance last year, 46 per cent. belongs to Michigan; in the Literary Department, 63 per cent.; in the Medical, 35 per cent.; in the Law Department, 34 per cent. In 1871–2, the percentage in the Medical and Law Departments was exactly the same, in the Literary Department 64, in the University, (all Departments,) 47 per cent.

Twenty-nine States and Territories, and Ontario (Canada) Nova Scotia, New Brunswick, the Hawaiian Islands, and Japan furnish us students. Illinois sends us most after Michigan, 142; Ohio, 108; New York, 77; Pennsylvania, 60; Indiana, 50; Massachusetts, 17; Maine, 7; Vermont, 6. New England furnishes us 33. It is obvious that our work is national in its breadth, as is becoming in a University, which is founded upon a national endowment. Michigan is however in part at least compensated for the generosity, with which she offers almost gratuitously the opportunity for gaining collegiate and professional education to the sons of other States, by the constant accession to her population of cultivated men, who attracted here by the facilities for study, remain on her soil to adorn the walks of professional and business life.

We are pleased to see that very few of our students are not pursuing some one of our three regular courses. The total number registered in our Calendar as engaged in selected studies is only 28. Last year it was 46. Of these 28 not more than 15 are really intending to continue in a select course. The others are striving to enter upon some regular and complete course, but yet are lacking sufficient proficiency in some one or more branches to take their places in the class they propose to join.

Of the students in the regular courses about 43 per cent have this year pursued the Classical Course, 18 per cent the Latin and Scientific Course, and 39 per cent the Scientific Course. Compared with the previous year there has been a slight increase in the relative proportion of students in the Scientific Course. It is probable that the increased requirements for admission to the Scientific Course may reduce this proportion.

The number of women, who enroll themselves as students in the University continues to increase. Two years ago it was 37; in 1871–2 it was 64; in 1872–3 it was 88. The attendance of women was, by Departments, as follows; in the Law Department 4; in the Medical Department 40; in the Academic Department 45. These last were according to the Calendar distributed as follows: Resident Graduates 2; Senior Class 1; Junior Class 7; Sophomore Class 8; Freshmen Class 20; Select Course 5; Pharmacy 2. Of the 35 in the regular courses of study, 14 pursue the Classical, 14 the Latin and Scientific, and 7 the Scientific. Of the graduates 8 are women; 1 in the Law Department, 1 in the Literary, and 6 in the Medical.

The history of our work during the past year has only deepened the impression made during the two previous years, of the entire practicability of imparting collegiate and professional education to the two sexes in the same schools. If any have cherished a fear that the admission of women would tend to reduce the standard of work in the University, their attention may be directed to the fact that during the last three years we have been steadily increasing the requirements for admission and broadening the range of studies. Now certainly the women experience no such difficulty in acquiring the studies assigned in the regular curriculum as to call for any modification of the course on their account. Their record is as creditable in all branches as that of their classmates of the other sex. Nor do I see any evidence that their success in their intellectual pursuits is purchased at the expense of health. On the contrary I doubt if an equal number of young women in any other pursuit in life have been in better health during the year. I am persuaded that with ordinary care and prudence, any one of our courses of study may be completed by a young woman of fair ability without undue draft upon her strength. None of the many objections, which are still raised against the co-education of the sexes have thus been found in practice here to have any force. The admission of women has led to no new difficulty or embarrassment in the administration of the Institution. It has certainly brought to a large class the benefits of such an education as otherwise would have been out of their reach, and has awakened through the State and the country and even in foreign lands a new interest in the University.

NUMBER OF GRADUATES.

The following is the number of degrees conferred:

Pharmaceutical Chemist, ...	9
Civil Engineer, ...	11
Bachelor of Science, ...	12
Bachelor of Philosophy, ...	15
Bachelor of Arts, ...	40
Doctor of Medicine, ...	91
Bachelor of Law, ...	123
Master of Science (in course), ...	8
Master of Arts (in course), ...	19
Master of Arts (on examination), ...	1
Total, ...	329

The honorary degree of Doctor of Laws was also conferred on one person.

THE REQUIREMENTS FOR ADMISSION.

We have been for some time gradually raising the standard of requirements for admission, as the High Schools of the State have been elevating their courses. We asked last year a twelve-month's study of French of the candidates for admission to the

Latin and Scientific Course, and secured very creditable preparation in that language. This year we ask the same of the candidates for the Scientific Course, and also the Elements of Natural Philosophy, Botany, Geology and Zoölogy. Heretofore the preparation of students for this course has been almost exclusively mathematical, and it has been found very desirable that they should have had training in some other direction. The additional requirements are those which, answering this purpose, it was supposed the schools of the State could most easily furnish. It may perhaps be open to discussion whether somewhat extended studies in English could not be profitably substituted for the elements of the Natural Sciences. But after conference with some of the leading teachers, it has been thought best at present to try the plan announced in the Calendar.

OUR RELATIONS WITH THE HIGH SCHOOLS.

We desire to keep in complete harmony with our schools, and to advance no faster than they can follow. The spirit and energy with which they press on in support of us are worthy of all praise, and we should ever be glad to recognize their hearty coöperation.

We have now finished our second year's trial of receiving without examination the graduates of High Schools, which have been inspected and approved by the Academic Faculty, and I think there is no difference of opinion in the Faculty concerning its salutary effect. In 1871–2 we received 50 Freshmen from six schools. Last year we received 40 Freshmen from five schools. We have suffered no embarrassment from this source in respect to the quality of the preparation of our Freshmen. The Superintendents and Teachers of the approved schools evidently feel the responsibility of being made virtually examiners for admission to the University, and of thus becoming thoroughly identified with us. The visits of our Committees keep us constantly in intimate relations with the schools, and according to the testimony of the Superintendents furnish a valuable help and stimulus to the schools. The Faculty after examination voted to receive for the coming year the graduates of the following schools: Detroit, Flint, Pontiac, Jackson, Adrian, Coldwater, Grand Rapids, Ypsilanti and Ann Arbor. Other schools in the State will probably next year be organized on a sufficiently broad basis and well enough equipped and manned to be placed on the same footing. We are certainly approximating towards a more substantial unity in our public system of education than any other State in the Union.

THE WORK OF THE YEAR.

It is impossible to find any measure of the work accomplished by our teachers and students during a year. It can only be said in general terms that we have proceeded without any serious interruption and with the usual assiduity. The breaking out of the small-pox among the medical students threatened for a brief period to interfere with the work in the Medical Department, but the lectures were not suspended. Unfortunately, the disease caused the death of four of the medical students and of one of the students in Pharmacy.

In the various examinations which have been held during the year, students have been "conditioned" in one hundred and sixty nine cases, that is, owing to their deficiency have been required to pass another examination on a certain portion of the study pursued; and have "failed to pass" upon some one study in seventeen cases, that is, have failed so signally that they are required to pursue the study again with the class below them.

One student has been expelled, and one suspended for a year, for disorderly conduct.

Our courses, with the exception of the Engineering Course, are so arranged, and probably with wisdom, that in the first two years the demands imperatively made upon students are decidedly heavier than in the last two years. The theory is that in the last half of the college life of the sudent, he should have more leisure left him for reading and for such broad and generous study as the more advanced studies of the course invite and encourage. This privilege, which is properly granted to all, will be abused by some, the lazy and indifferent, who desire to do only so much as is necessary to secure a diploma. Hence the policy upon which our curriculum is arranged, is sometimes criticized. But surely, it would be folly to deny this opportunity to the industrious and aspiring for the sake of forcing a little more labor out of a few men, who would do it as mere task work and bring from it no satisfactory results. A collegiate course cannot be wisely shaped with primary reference to driving drones to work. It should provide every manly and noble incentive to worthy achievement.

We have thought that something would be gained in heartiness and enthusiasm in work, if we should offer larger opportunities for choice of studies in the latter part of the course, and especially in the senior year. Accordingly we have offered an almost unlimited option of advanced studies to all the seniors except the Engineers, who are necessarily compelled to keep their work within narrower limits, which are fixed by the technical needs of their future profession. As our courses are arranged, by the end of the Junior Year, the students have laid the foundation of attainments in all the various departments of thought, except Philosophy, which will engage their attention before graduation. It seems well, therefore, that while the study of Philosophy should then be insisted on as essential to every educated man, the mature student should be permitted to concentrate his energies during the last year upon such other branches as he may choose. A large class will thus by natural choice be broken into sections, which are not too large to work profitably together, and will bring to their studies, it may be hoped, a zeal and freshness which will ensure the happiest results.

THE OBSERVATORY.

The Professor of Astronomy has been engaged, in addition to his duties in giving instruction, in continuing his work of observing small stars near the Ecliptic, and his work upon the Lunar Theory. He discovered two more new planets during the last academic year, making in all fifteen which have been discovered at this Observatory up to that date.*

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*Prof. Watson has since the end of the Academic Year discovered two more, making the whole number seventeen.

THE MUSEUM.

We have been receiving very valuable collections from Mr. J. B. Steere, who has been continuing his labors in South America. The zoölogical and botanical specimens which he has sent are of great interest, but perhaps the objects, which illustrate the life of the ancient Incas are of equal importance. We are also indebted to many of our alumni and other friends for donations.

Prof. Winchell in his last report takes occasion to review the growth of the Museum, since he took charge of it. It appears that in the Departments of Geology, Zoölogy, Botany and Archæology, we have 30,733 entries and 105,499 specimens, and that, as is believed, the museum of only one of our institutions of learning surpasses ours in the number of specimens. By far the larger part of this collection has been made during the period of Prof. Winchell's service. He has thus left behind him a fitting memorial, which will ever testify to his long and faithful labors in the University.

THE LIBRARY.

There have been added to the General Library during the year by donation 547 volumes, by purchase, 283 volumes and 65 pamphlets. The number of reviews, magazines and newspapers on the tables was 143. Of these 78 were furnished by the Students' Lecture Association. The work of cataloguing and arranging the Parsons' Library have been continued. It gives me pleasure to say that the liberal thoughtfulness of the donor of that Library, Philo Parsons, Esq., has this year made important additions to our Library, especially of works upon Political Economy and International Law. It is becoming apparent that the time is not distant when we shall be in pressing need of a library building. The room, which we at present occupy, is already somewhat crowded, and moreover is desired by the Law Department, for whose service it was intended. I hope too that at no remote day the resources of the Library will be so increased that a few thousands of volumes of the kind of books, which students most frequently need, may be set apart to be drawn by the readers and taken to their rooms. I think that while no serious abuse would flow from the privilege, it would be of real service to the students.

UNIVERSITY HALL.

We were able to occupy the lecture rooms and the Chapel in University Hall about the middle of last October. This was a great relief to our classes, who had been crowded into our old rooms in so rapid succession that it was impossible to preserve at the same time proper temperature and ventilation. The rooms are light and cheerful and answer their purpose admirably, with the exception perhaps of the lecture rooms on the ground floor, which will be entirely serviceable, when the floors are properly deadened. Our wonder is that we were able to dispense for so long a time with the accommodations now provided for us. I cannot but call attention again to the fact that we urgently need an organ for the Chapel and another for the new hall. Since two such instruments as we need can be procured in Germany for $3,000, may we not hope that some friends of the University will furnish us with them?

THE PROFESSIONAL SCHOOLS.

Notwithstanding the multiplication of schools of law and of medicine in the west, the attendance upon our professional schools shows no signs of falling off. Students are drawn to them from all parts of the Union, and from beyond our national boundary. In general, the professional students devote themselves to their work with assiduity. A considerable number, especially of the law students, pursue one study with the undergraduate classes, as they are all permitted to do under our rules. The old question, what requirements, if any, shall be made for admission to these schools, is still unanswered, or is practically answered by making no requirement of intellectual attainment. It is a difficult question in view of the fact that practically no requirement is made elsewhere in the country. I am inclined to believe that the most we can at present easily do is to ask for a substantial knowledge of the fundamental elements of an English education.

But so much we should do, and make the examinations a reality. Written examinations even of our large classes could be conducted without great labor, and would, I hope, save us the presence of some persons, who do us no credit while they are here or after they leave us. I still look however to the general diffusion of education through our constantly improving schools for our help in this regard.

The crowded state of our little hospital during the year furnishes another argument if any is needed, for the establishment of a larger and more commodious hospital either by private or by public benefactions. Various plans for accomplishing this end have been considered, but none seems yet to be feasible for us.

OUR SUPPLIES AND OUR NEEDS.

In my last Report I expressed the confident hope that the State would relieve us of the embarrassments, with which we were threatened by the inadequacy of our income to meet our increasing expenses. That hope was not delusive. The Legislature, reflecting in its action the obvious wishes of the people, made prompt and generous provision for our help. They voted us $13,000 to meet the deficit in our last year's account, and $25,000 to complete University Hall, and in place of the annual appropriation of $15,000, which we have had for many years, the proceeds of a tax of one-twentieth of a mill on the ratable property of the State, provided that the sum thereby appropriated shall not exceed $50,000 annually before 1881. This tax will yield now $31,500, but at the next appraisal of the property of the State in 1876 will of course furnish a handsome increase. The Legislature and the State may be assured that the University fully appreciates this ready and liberal response to her statement of her needs. Our friends however ought not to suppose that this increase of our resources will for the present allow us to enlarge our work in any particular. It simply enables us, by the use of great economy, to continue upon the same scale as at present, without incurring debt. We cannot yet add a single professor to our corps. We cannot yet procure many of those appliances for illustrating instruction, which we hardly know how to dispense with. We can make no important addition to the Libraries. Still less can we take any large steps toward that expansion of our scientific work, which is so imperatively demanded at our hands. But we gladly interpret the action of the Legislature as a fresh proof of the purpose of the State to sustain the University as a part of her educational system. We trust that private munificence will not deny itself the rich reward, which flows from the endowment of a seat of learning like this, but we cherish an abiding confidence that the pride and affectionate interest of the State in the University will ever insure it a vigorous and useful life.

Respectfully submitted,

JAMES B. ANGELL.

Regent Rynd in behalf of the Committee on Medical Department, to whom were referred the papers read by Dr. Pratt of the State Medical Association, and of Dr. Hawxhurst from the Committee of the State Dental Association, stated that he was not ready to report, and asked for further time, which was granted.

The following communication was received and read by Regent Rynd.

Ann Arbor, Oct. 7th, 1873.

To the Hon. Board of Regents of the University of Michigan:

Gentlemen:—In behalf of Prof. Cheever and himself, the undersigned would respectfully ask leave of absence from duty as lecturers for one year. They indulge the hope that by availing themselves of the sanative influence of a more congenial climate, they may be restored to their usual health, and be able to resume their work as heretofore.

Very Respectfully,

A. Sager,

Dean of Faculty.

Regent Rynd presented the following resolution which was adopted.

Resolved, That Dr. Sager and Dr. Cheever be granted leave of absence for one year, and further that they be respectfully requested to report to this Board at its March meeting, in regard to their probable future relationship to the University.

The following report was presented and read by Regent Gilbert, Chairman of the Finance Committee, and ordered printed in the minutes.

REPORT OF THE FINANCE COMMITTEE.

The Finance Committee submit herewith the annual report of the financial condition of the University for the year ending June 30th, 1873.

The receipts into the Treasury during the year have been as follows:

GENERAL FUND.

Balance on hand July 1, 1872, as per Treasurer's Report...$	20,225 46
(Of this amount $14,898 83 was due that day for salaries, leaving an actual balance belonging to the University of $5,326 63.)	
Received from State Treasurer on account of University Int. Fund..	38,667 00
Of State Treasurer, Annual State Aid.....................	15,000 00
" " " Account of 1873 for Deficit..........	13,000 00
Received for Students' Fees..............................	23,005 00
Rec'd of University Treasurer for Int. on funds in his hands..	191 88
Proceeds of a temporary $7000 loan......................	6,879 18
A loan to Building Fund repaid...........................	7,500 00
Total..	$124,468 52

The disbursements have been as follows:

DISBURSEMENTS.

Paid for Salaries and Janitors' wages the last quarter of the previous year, and the first three quarters of the current year..........$	73,392 16
Paid for account of Gen. Library.............	1,300 00
" " " " Med. "	400 00
" " " " Law "	550 00
Loan to Building Fund (repaid)...............	7,500 00
Paid Sixty-day Loans.........................	7,000 00
Contingent Expense ac........................	17,274 65
Amount of bal. to Cr. of Gen. Fund...........	17,051 71
Total..................................	$124,468 25

Of the above balance of $17.051 71 to the credit of the General Fund at close of the fiscal year there was due that day for salaries of the last quarter of the previous year the sum of $15,262 50, leaving as an actual balance in the Treasury $1,789 21; and in the hands of the Secretary of the Board balance of unexpended appropriations, $583 66.

The total amount appropriated during the year for contingent expenses was $17,274 65, for the following purposes:

For repairs and alterations	$ 1,800 00	
For Insurance	1,600 00	
For Fuel and Light	4,518 45	
For Hospitals	1,296 40	
For Postage	300 00	
For Care of University Ground	200 00	
For Regents Expenses	204 30	
For Advertising Med. Dept	150 00	
For Glass Ware	50 00	
For Annual Announcements	75 00	
For Apparatus for Dept. of Physics	658 67	
For Diplomas	221 50	
For Lightning Rods	187 70	
For Incidental Expenses of Museum	50 00	
For Repairs of Laboratory Boiler	233 34	
For Museum Cases	250 00	
For Apparatus for Engineering Dept.	478 95	
For Int. on Deferred Warrants	74 51	
For Steward's Contingent Expense ac.	4,925 83	
Total		$17,274 65
Unexpended bal. in hands of Sec. of the Board		$ 583 66

The Vouchers for the above, presented by the Secretary of the Board have been examined by Regent Grant and found correct.

RESERVE FUND.

Michigan 7 per cent Bonds	$ 7,000 00
East Saginaw 10 per cent Bonds	6,500 00
Ann Arbor 7 per cent Bonds	3,200 00
Manchester 10 per cent Bonds	1,500 00
Midland City 10 per cent Bonds	1,000 00
Total	$19,200 00

And the amount now in the treasury to the credit of interest paid on the funds is $2,182 67.

The receipts for the fiscal year ending June 30th, 1874 are estimated as follows:

Balance on hand July 1, 1873	$ 17,051 71
From the State for Interest on University Funds	38,000 00
Annual State Aid (act of 1873)	31,500 00
Students' Fees	20,000 00

Rents	250 00
Interest on Treasurers' Account	250 00
Total	$107,051 71

The disbursements for the same time are estimated as follows:

For Salaries due June 30, 1873	$ 15,262 50	
" " the first three-quarters of the current year	58,500 00	
For Annual Catalogue	1,200 00	
For Insurance	1,800 00	
For repairs	1,500 00	
Fuel and Light	4,000 00	
For Libraries	2,500 00	
For Improvement of Grounds	400 00	
For Steward's Contingent account	4,000 00	
For Salaries of the last quarter of the current year due and payable June 30, 1874	15,925 00	
Unpaid account for catalogue of 1872-3	1,000 00	
Total		$106,087 50
Probable Surplus		964 21

The Finance Committee will not at this time make a detailed report on the cost of the new building, preferring to wait until the next meeting of the Board, when the building will be fully completed and all bills presented.

The Report of the Treasurer herewith presented shows payments on account of the building for the year ending June 30th, 1873, $75,198 84.

The Committee can however now state, that the cost of the building will exceed the appropriations made by the Legislature by the amount of the interest we have been obliged to pay on money borrowed in anticipation of the tax raised for its construction.

The Board will notice that our unavoidable expenses keep pace with the appropriations made for the support of the University, and that it will be necessary to keep strictly within the estimates in all expenditures. In the year 1876 we may expect a considerable addition to our income under the operations of the Act of 1873, but until that time have no reason to expect any material addition to our present income of about $90 000.

The annual report of the Treasurer is herewith presented.

THOS. D. GILBERT, }
H. A. BURT, } *Com.*
C. B. GRANT, }

Regent McGowan moved that a committee of three be appointed by the President to examine the rooms set apart for the use of the Engineering Department, and report the alterations and repairs needed, at the next meeting of the Board. The motion prevailed and the President appointed Regents McGowan, Willard and Grant such committee.

The following preamble and resolution presented by Regent Rynd was adopted unanimously.

WHEREAS, His Excellency, Gov. John J. Bagley transmitted on the 29th day of September last some ninety or more copies of medals ordered by Congress, by States, and by private parties at different times, with a beautiful and suitable table on which they may be exhibited as a donation to the University; therefore

Resolved, That the Board of Regents hereby tender their hearty thanks to his Excellency for his interesting and valuable and peculiarly appropriate gift.

Regent Rynd presented and read the following notice and requested that it should be printed in the minutes. The request was granted.

"I hereby give notice that I shall at the next meeting of the Board of Regents, ask for the adoption of such regulations as shall secure an enlarged literary culture on the part of students entering the graduating class of the Medical Department of the University, and the enforcement of such regulations as may be agreed upon. I shall also ask that such modifications be made in the Department as will ensure a higher grade of professional acquirement on the part of graduates."

The annual report of the Librarian was read by Regent Estabrook, and on motion of Regent Walker it was accepted and ordered placed on file.

Regent McGowan presented the following resolution:

Resolved, That the application of F. W. Corliss for an honorary degree be referred to the Committee on Classical Course.

The resolution was so referred.

Regent Rynd read a communication from Dr. A. J. Hamilton, a graduate of the Medical Department of the University of Michigan, Class of 1870, stating that his Diploma had been destroyed by fire, whereupon Regent Rynd offered the following resolution which was adopted:

Resolved, That the Steward is hereby instructed to furnish a duplicate diploma to Dr. A. J. Hamilton of the Medical Department Class of 1870, upon payment of the usual fee.

Regent McGowan, on motion of Regent Willard, was appointed to prepare the Annual Report of the Board to the Superintendent of Public Instruction.

Regent Walker presented the following resolution which was adopted:

Resolved, That Five Hundred extra copies of the President's Report be printed for distribution, and for the use of the Board.

Ayes—Regents Walker, Willard, Gilbert, Burt, Estabrook, McGowan, Grant and Rynd.

The following resolution was presented by Regent Willard and adopted:

Resolved, That no application for a degree shall be acted upon by the Board previous to its submission to the appropriate Faculty of the University.

Regent Burt, Chairman of the Committee on Museum, read the reports of Dr. E. W. Hilgard and Prof. M. W. Harrington on the condition and wants of their departments. He also presented the following resolution.

Resolved, That the sum of two hundred and fifty dollars be appropriated and placed at the disposal of Prof. E. W. Hilgard, to be used in such improvements in his department as he may deem necessary.

Ayes—Regents Willard, Walker, Gilbert, Burt, McGowen, Estabrook, Grant and Rynd.

The following resolutions were presented by Regent Walker and unanimously adopted:

Resolved, That the thanks of the Board be tendered to Capt. W. H. Dall, of the U. S. Coast Survey, for his valuable donation of suites of Alaskan plants.

Resolved, That the thanks of the Board be tendered to Prof. M. W. Harrington for his valuable gift of about two thousand species of plants to the University.

On motion the Board went into executive session, at the close of which the regular business of the meeting was continued in open session.

The following resolution was presented by Regent Grant:

Resolved, That Mr. Leslie Irving be appointed acting Professor of the English Language and Literature for the current year at a salary of Two Thousand Dollars.

Ayes—Regents Walker, Willard, Gilbert, Burt, Estabrook, McGowan, Grant and Rynd.

Regent Walker presented the following resolution:

Resolved, That Mr. Seneca Haselton, B. A., be appointed Instructor in Mathematics at the usual salary.

Ayes—Regents Walker, Willard, Gilbert, Burt, Estabrook, Mc Gowan, Grant and Rynd.

The following resolution was also offered by Regent McGowan.

Resolved, That Edward S. Dunster, M. D., be appointed Lecturer upon Obstetrics and Diseases of Women and Children for the present year, during the absence of Professor A. Sager, at the usual salary, and that Frederick H. Gerrish, M. D., be appointed Lecturer on Therapeutics, Materia Medica and Physiology for the current year, in the absence of Prof. H. S. Cheever, M. D., at the usual salary.

On motion of Regent Burt it was

Resolved, That a Special Committee of three be appointed by the President to revise the committees of the Board and define the duties of the several committees, and report at the next meeting of the Board.

Regents Walker, Willard and Gilbert were appointed such committee.

Regent Grant presented the following resolution which was adopted.

Resolved. That the question of Librarianship of the General Library, and the employment of assistants, be referred to the Library Committee with instructions to report fully at the next meeting of the Board, what, in their opinion, the best interests of the University require us to do.

The following resolution presented by Regent Rynd was adopted:

Resolved, That Regents Grant, McGowan and Walker be and are hereby instructed to secure such legal counsel as they may deem necessary to defend the interests of the University in the suit now pending.

The following appropriations were made on recommendation of the Finance Committee.

For Contingent Expenses	$1,000 00
For Insurance	$1,000 00
For Fuel and Light	600 00
For Alterations and Repairs	500 00
For Regents' Expenses	126 95

The vote was as follows:

Ayes—Regents Walker, Willard, Burt, Estabrook, McGowan, Grant and Rynd.

On motion of Regent Burt the Board adjourned to Tuesday evening, January 6th, 1874.

H. D. BENNETT, SECRETARY.

UNIVERSITY OF MICHIGAN.

THE

PRESIDENT'S REPORT

TO THE

BOARD OF REGENTS

FOR THE YEAR

ENDING JUNE 30, 1874.

ANN ARBOR:
PUBLISHED BY THE UNIVERSITY.
1874

PRESIDENT'S ANNUAL REPORT.

To the Honorable the Board of Regents:

I have the honor to present to you my Report for the year, which ended June 30, 1874.

THE FACULTIES.

At the June meeting of the Regents, 1873, Donald Maclean, M. D., Lecturer on Surgery, was elected Professor of Surgery.

At the October meeting Leslie Irving, M.A., was appointed Acting Professor of the English Language and Literature, Edward S. Dunster, M.D., Lecturer on Obstetrics and Diseases of Women and Children, Frederic A. Gerrish, M.D., Lecturer on Therapeutics, Materia Medica and Physiology, and Seneca Haselton, B.A., Instructor in Mathematics. Dr. Sager and Dr. Cheever were granted leave of absence for a year, on account of their ill health.

In March, 1874, Dr. Sager, fearing that his infirmities would prevent him from discharging the duties of his chair, tendered his resignation. It seemed necessary to accept it, though it was with deep regret that we saw this scholarly and devoted friend of the University draw to a close his period of thirty-two years' active labor in her service. He was appointed Professor Emeritus, and we are happy to say that he has consented to fill the office of Dean of the Medical Faculty.

Dr. E. S. Dunster was appointed to the chair vacated by Dr. Sager.

Dr. Cheever was granted leave of absence for another year, and Dr. Gerrish was appointed Professor of Therapeutics, Materia Medica and Physiology.

In June last, W. W. Beman, M.A., was appointed Assistant Professor of Mathematics, and Henry F. Burton, B.A., Instructor in Latin. E. L. Walter, M.A., Assistant Professor in Latin, received permission to be absent in Europe for two years.

Our Faculty roll carried forty-two names. Three men were not on duty. Thirty-nine were actually engaged in work here.

THE NUMBER OF STUDENTS.

The total number of students in attendance last year was 1112, as follows:

Department of Literature, Science and the Arts.

Resident graduates,	9	
Seniors,	72	
Juniors,	96	
Sophomores,	90	
Freshmen,	118	
In selected studies,	34	
Pharmacy,	70	
Total,		489

Department of Medicine.

Students,		314

Department of Law.

Seniors,	124	
Juniors,	192	
Total,		316
		1119
Deduct names counted more than once,		7
Total in the University,		1112

It will be remembered that we print no names, save those of students actually present. Compared with the rolls of the previous year, we find an increase of 6 in the Literary Department, a decrease of 36 in the Medical Department, and a decrease of 34 in the Law Department. We have good reason to believe that this decrease in the professional schools was due in large part, if not wholly, to the financial distress of last autumn. We know of a good number of students, who had intended to be here, but who suddenly found themselves straitened in resources.

The relative number of students from our State and from other States continues nearly the same. Michigan furnished this year 46 per cent. of all the students in the University; 60 per cent. of those in the Literary Department; 38 per cent. of those in the Medical; 33 per cent. of those in the Law Department. There seems to be a tendency to a slight relative increase of students from other States.

Thirty-five States and Territories, and Ontario (Canada), New Brunswick, the Hawaiian Islands, Japan, and Natal (South Africa) were represented in our classes this year. As usual, Illinois furnishes us, next to Michigan, the largest number of students, 111; Ohio sends 108; New York, 82; Indiana, 51; Pennsylvania, 42; Wisconsin, 33; Iowa, 27; Ontario, 25; New England sends us 30, every State being represented. From the Middle States, New York, New Jersey, Pennsylvania, Delaware, we have 138. We glad are also to welcome students from seven of the Southern States. There are indications that increasing numbers may soon be expected from that part of the country. The fact is auspicious both for the South and the North, that the young men of the two sections are again meeting in friendship in the halls of learning. Michigan is happy to open the doors of her schools and University, almost without price, to the students from every State and every land, and to give them the same facilities for culture, which she has provided for her own sons and daughters.

It appears from our records that the increased requirements for admission to the Scientific Course have diminished the relative number of students in that course. Last year it contained (including the Civil Engineers) 39 per cent. of the undergraduates in regular courses. This year it has but 33 per cent. The Classical Course has 47 per cent., and the Latin and Scientific 20 per cent. We are satisfied by the results that it was wise to ask the additional preparatory study for those who choose the Scientific Course, even though temporarily the number entering upon it is somewhat diminished. The schools are ready to furnish the preliminary training demanded, and the old numbers will be soon regained. The students, bringing some linguistic as well as mathematical culture to their duties, will be able to make their residence here more fruitful of good.

THE PREPARATORY WORK.

We have been for the last few years rapidly raising the requirements for admission to the academic department, until in some respects they are, I think, higher than that of any other Institution in the country. The whole of the work in Mathematics and in French, which not long ago was done in our Freshman year, has been remitted to the schools. By so much, therefore, the excellence of our public schools has enabled us to raise our work. We desire always to acknowledge our indebtedness to them for the spirit and energy with which they have responded to our requests for a more extended preparatory course. The prosperity of the University could never have been attained, if teachers and Superintendents and School Boards in the State, and I may add, the people also, were not animated by so ardent and lofty a purpose to give to our whole educational system from the primary school to the University the greatest possible efficiency. It is because this Institution draws its vigorous life from these vigorous schools, and because they are nourished and sustained by this intelligent public sentiment, that we cherish our bright hopes for the future of the University. That we and the schools, from the lowest to the highest, have a common purpose and interest, that our educational system is a unity, cannot be too often nor too strongly emphasized.

We received last year 67 students on diploma (without examination) from the following schools: Grand Rapids, 1; Coldwater, 2; Flint, 3; Detroit, 3; Pontiac, 4; Jackson, 6; Adrian, 6; Ypsilanti, 9; Ann Arbor, 33. We continue to cherish the belief that this connection with the schools is profitable both to them and to us. It is only just, however, to say that some of our schools, which are not so organized and equipped that under our rules we can establish this relation with them, are annually sending us students, whose preparation is most creditable to their teachers. Without disparaging any other instructors, we may be pardoned for expressing the pleasure it affords us to see so many of our alumni in charge of schools in our State and in adjacent States. Through them the University is fulfilling one of its best functions. For it is disseminating its own ideals of scholarship and training among large classes, whom it cannot directly reach.

THE WORK OF THE YEAR.

The most important change made in the undergraduate work this year, was the opening of almost all the studies of the Senior year to election. In all the courses except the Civil Engineering, Philosophy alone, and that for one semester, was required. Each student was allowed to choose any three studies he preferred. Both students and teachers were gratified at the result. Two advantages were experienced. The pupils entered with greater zest into their work, and the class being thus by natural selection broken into sections, freer and better methods of instruction were found practicable. We hope to be able ultimately to arrange our work so as to apply the same principle to most, if not all of the studies of the Junior year.

While most of our American colleges now open some choice of studies to undergraduates, there is still much discussion of the questions, how much liberty of choice shall be granted to the student, and what is the best method of providing for the choice. Most of the older and the stronger colleges require preparatory work in classical studies, and allow a limited choice in the Senior year, Harvard, requiring the classical preparation, opens an almost unlimited choice after the Freshman year. Cornell, not demanding a classical preparation, allows an almost unrestricted choice, from the beginning of the course. Yale, insisting on the classical preparation, leaves little choice anywhere in the course. Harvard proceeds on the theory, that having a thorough classical preparation, the undergraduate may after a year be left to determine his course; Cornell, on the theory that he may, at the outset, even if he has had no such training; Yale, that he had best be required to take the path, which has been found to lead to good results. Our plan differs from all these, and seems to us to secure pretty well the desired steadiness of aim on the part of the student, and such liberty of action as he can wisely use. The average age of our students on entering college is about nineteen and a half years. We assume that they may, as a rule, be trusted to decide whether they wish to take a classical course, a course embracing Latin, but omitting Greek, or a Scientific course, leading by one of its branches to Engineering studies. When the student has chosen his course, we hold him for two years or more rigidly to a fixed path, which carries him through the disciplinary and fundamental studies belonging to his course. Our Freshman and Sophomore years are charged heavily with rigorous work, especially in the languages and the mathematics. Those, who cannot carry successfully that kind of work, are sifted out and dropped. Those, who can, have by the end of the Junior year or earlier laid the foundations of knowledge in all the various departments of thought. They can therefore, it is presumed, wisely choose in what direction they will push their last year's studies.

It is well that various Institutions are trying different experiments. Theoretical dogmatizing is no better in education than elsewhere. One of the most encouraging signs in our American collegiate life is this willingness to admit that possibly something yet remains to be learned about collegiate methods and the courageous readiness to try new ways.

It is sometimes thought that colleges with large classes can not well accomplish the thorough elementary work, which should be done in the earlier part of the course. It is therefore proper to say that we divide our classes into sections, wherever necessary. We divide the Freshman class into sections of twenty or twenty-five students, so that due attention can be given to each person.

I am happy to say that the advanced classical work in this University is now done in a larger, freer, more generous spirit than has prevailed in many American colleges for the last twenty or thirty years. An acquaintance with the critical methods of German philologists has been of vast service to learning in this country. But I believe most of the better classical scholars in the country are ready to admit that college professors have erred in employing too much of the time and strength of the undergraduates in what may be called a philological training, and too little in a larger, literary training. People have not failed to inquire why the men, who graduated at American colleges at the beginning of this century or at the end of the last, and who had little or none of this nice philological training, had so much more genuine love for classical literature than the graduates of the last thirty years, and continued to read it with interest in the midst of the duties of professional life. It was discovered that they actually read enough in college to get a familiarity with the vocabulary of the ancient tongues, and a real enjoyment of the masterpieces of classical literature, while on the other hand the students of later days have too often been asked to pursue even the classical work of the senior year as if the chief works of the old writers were designed mainly to illustrate a grammatical textbook. Now while those, who are to be philologists, may well continue the nicest study of the details of the ancient tongues through their college course and longer, it is true that the great majority of American students do not have such an object in view. It should be the aim of the professor, after they are sufficiently familiarized with the structure of the language,—as they certainly should be by the Junior year at latest,—to shape his teachings and their work so that they may be able to read ancient works with hearty enjoyment, and may carry away with them into life the power and the desire to read them. I may safely say that our advanced classes are conducted in this spirit and with this aim, and that a most gratifying and genuine enthusiasm is the result. It is gratifying to believe that the same idea of classical work is already cherished or is gaining ground in several other of our best American colleges.

A considerable number of our graduating class always engage in teaching for some time after leaving us. The Faculty thought it might be of service to the most deserving students, and also to the schools, to offer to the members of the class, who should by special examinations show special fitness for teaching certain branches, a "Teacher's Diploma," signed by the President and the Professors in charge of the studies pursued. Several members of the graduating class applied for the Diploma and received it.

It cannot be doubted that some instruction in Pedagogics would be very helpful to our Senior class. Many of them are called directly from the University to the management of large schools, some of them to the superintendency of the schools of a town. The whole work of organizing schools, the management of primary and grammar schools, the art of teaching and governing a school,—of all this it is desirable that they know something before they go to their new duties. Experience alone can thoroughly train them. But some familiar lectures on these topics would be of essential service to them.

During the three years of my acquaintance with the University there has been, I think, a gradual improvement in the observance of order on the grounds and in the buildings. There is an entire freedom from certain offenses common in many colleges. Though all our buildings are unguarded by night, I think students have not wilfully damaged them to the amount of five dollars this year. As is well known, we unfortunately had occasion last May to confront the chief abuses, which had a foothold here, viz., hazing, and a disposition, occasionally manifested before, on the part of some students, to attempt by combinations and unpleasant demonstrations to press the government to recede from its action in a case of discipline. I regret to say that it became necessary to suspend until the beginning of this academic year about half of the members of each of the two lower classes.

During the year one student has been expelled for gambling, and one for complicity in preparing an obscene and abusive circular, which was distributed by night in the streets. The University has not before for years been disgraced by any papers of this kind, and I am happy to say that the students as a body showed a proper indignation at this vile act.

THE ADMISSION OF WOMEN.

The reception of women into our classes continues to attract much attention. Frequent inquiries are made of me concerning the experiment, not only from college men and others on this side of the Atlantic, but also from English men and women. An unprecedented interest is at present felt in Great Britain in the higher education of women. By one means or another women are gradually getting the benefit of the instructions of some of the leading University Professors, and it is found there as here that they bear off their full share of the honors of high and strenuous intellectual work. Our success has been referred to in numerous articles, which the friends of the higher education of women have published in England. It is noteworthy that some of the German universities are following the example of the schools at Zurich and Berne in admitting women to their lecture rooms.

Hardly any subject has been discussed with more spirit during the last year in this country in journals, magazines and books than that of the co-education of the sexes. The ground once maintained by some, that the women have not the intellectual gifts required to master the severe studies of a collegiate course, seems to be generally abandoned. It would indeed seem difficult to hold it in the face of the brilliant successes of women in our own classes, both in the Literary Department and in the professional schools. The main argument now pressed is the physiological. I do not propose here to discuss the positions which have been taken. But I may be permitted to bear witness that our experience does not by any means justify the fear that the work of our Institution in either Department cannot be done by young women without detriment to their health. I can emphatically repeat what I said a year ago, that I doubt if an equal number of young women in any other pursuit in life have been in better health during this year than those who have been under our roof.

In discussing the subject of opening the doors of our colleges to women, two quite distinct questions are often confounded. These questions are, first, whether all women, who aspire to a high education, shall be educated in the colleges with men, and, secondly, whether those, who for any worthy purpose desire the education now given only in the colleges and professional schools, originally intended for men alone, should be permitted to attend those Institutions and receive that education. One may argue that these last should have the permission they desire, and yet with entire consistency hold that the great mass of women may properly receive the kind of education they desire at the schools and colleges designed exclusively for women. But until the colleges for women have the same facilities for imparting the highest collegiate and professional education as are furnished by the best universities, it will be difficult to show why the doors of at least some of those universities ought not to be open to every woman, who desires and is qualified to enter them. And unless the teachings of the experience of every college, which has with good sense tried the co-education of the sexes, be refuted by some new experience, it will be equally difficult to show why every woman, who desires and is qualified for the education provided in our universities, should not as freely as any man have access to their privileges and be permitted to give to her mind the best development of which God made it capable.

The number of women in attendance at the University this year is 94, as follows: in the Law Department, 5; in the Medical Department, 38; in the Literary Department, 51. These last were distributed as follows: Resident Graduates, 1; Seniors, 6; Juniors, 8; Sophomores, 11; Freshmen, 17; Select Course, 5; Pharmacy, 4. One took both the course in Medicine and the course in Pharmacy. Of the 42 in the regular courses of collegiate study, 21 pursued the Classical Course, 15 the Latin and Scientific, and 6 the Scientific. Of the graduates 18 are women, 2 in the Law Department, 9 in the Medical, and 7 in the Literary. Three of these last received appointments to speak at Commencement.

DEGREES.

The following is the number of degrees conferred:

Pharmaceutical Chemist, ...	20
Civil Engineer, ...	14

Bachelor of Science,	13
Bachelor of Philosophy,	12
Bachelor of Arts,	35
Doctor of Medicine,	71
Bachelor of Law,	126
Master of Science (in course),	2
Master of Arts (in course),	18
Master of Arts (on examination),	2
Total,	313

The honorary degree of Master of Arts was conferred on one person, and the honorary degree of Doctor of Laws on another.

The members of the Literary Faculty, impressed with the importance of giving a higher significance to our Masters' Degrees, respectfully request you to confer no second degrees in course after 1877, and their opinion met with your hearty approbation. Accordingly after that date Masters' Degrees will be given only on examination. Heretofore a Master's Degree has been valuable only as a certificate that a person, who had graduated Bachelor, had existed three years after his graduation. We propose now that it shall really signify the acquisition of larger attainments than are required for the Bachelor's Degree. No one can receive it, who shall not have done a year's good work in post-graduate studies, here under our direction, or two years' work elsewhere, the value of which is to be determined by examination. In order to encourage scholars to a still more generous and extended course of study, we offer the degree of Doctor of Philosophy to the graduate, who shall pursue studies here for at least two years. The requirements for this degree will be high.

THE OBSERVATORY.

The Professor of Astronomy and his Assistants have been continuing their work with accustomed assiduity. He has during the academic year discovered two more planets, making seventeen, which have been discovered at this Observatory. He has at the request of the United States Government taken charge of the Expedition, which has been sent to Pekin, China, to observe the Transit of Venus in December next. He will be absent a year on this service. Proper provision has been made for the instruction of his classes and for the continuance of work at the Observatory during his absence.

THE CHEMICAL LABORATORY.

Though our Laboratory has been repeatedly enlarged, the accommodations have proved entirely inadequate to our needs during the past winter. We had 135 tables, but at one time a hundred students were waiting for tables. We have for some time felt the necessity of making larger provision for instruction in metallurgy and assaying. We have therefore been compelled to make another addition to the Laboratory. It consists of a wing 95 feet by 30. It will enable us to accommodate about one hundred more students, and there is good reason to believe that every table we can furnish will be at once needed, that nearly two hundred and fifty students must be provided for in our Laboratory during the coming year.

THE LIBRARY.

We have added to the Library this year by donation 246 volumes, by purchase 303 volumes, by binding periodicals 143 volumes. There were spread on the tables 164 reviews, magazines, and newspapers. Eighty-one of these were furnished by the Students' Lecture Association. The Parsons Library is now completely arranged and catalogued. Mr. Philo Parsons has again shown his generous interest in us by presenting us with some three hundred dollars' worth of most valuable works. We also received a most interesting souvenir of the visit of His Imperial Highness, the Grand Duke Alexis of Russia, to our State, in a present from him of about 100 volumes, pertaining chiefly to the History of Russia and of her universities.

I doubt if any Library in the country is, in proportion to its size, so much used as this. It is open from nine in the morning until half past nine in the evening, and at times is overcrowded with readers. It is greatly to be regretted that the provisions for its increase are so meagre. We are able to add less than 1000 volumes a year, including public documents of all kinds. It is superfluous to remark that we are unable to furnish more than a small fraction of the freshest works of sterling value, which are issuing from the press. There are many sad gaps in our supply of literature of every department of thought. The total number of volumes in the Library at the end of the year was 22,211.

THE MUSEUM.

The most important addition made to the Gallery of Fine Arts this year, is two excellent bronzes, copies of Michael Angelo's well known statues of the Medici brothers. They are two-thirds of the size of the originals. By direction of President White they were purchased in Paris by Dr. Frieze, from the proceeds of a fund, which has been in the custody of President White for such a purpose for some time.

Gov. Bagley has also presented us with a valuable collection of ninety medals, some of silver, some of bronze, struck by the United States or by States, in honor of our principal naval and military commanders, and Presidents, or in commemoration of important events in our history. He presented also a table of elegant workmanship, in which to keep them. They have been placed for the present in the Library.

The rooms now occupied by our Fine Arts collection are ill fitted for the purpose. They are too low and not judiciously lighted. In them it is next to impossible to protect the objects of art as they should be protected. A properly constructed gallery, which can be added to some building at comparatively slight expense, would attract additions to our collection.

In the Scientific Department of the Museum a good deal of work has been done in re-arranging specimens, and in classifying and labelling the numerous specimens, which our force had not sufficed to place in order. The South American collections of Mr. Steere still continue to be the most striking feature of the additions to the Museum. During the last year there were received from him 1,547 entries, comprising 8,503 specimens. The total additions to the collections last year were 4,820 entries, 17,574 specimens.

THE ENGINEERING ROOMS.

A good deal of work has been bestowed upon the rooms devoted to Civil Engineering. They had become thoroughly dilapidated from long usage. Still further improvements were ordered at the June meeting of the Regents. Appropriations, which were greatly needed, were also made for the more efficient equipment of the Engineering Department. More money can wisely be expended upon models and other means of illustration.

THE NEW HALL.

The Legislature having at their session in 1873 appropriated $25,000 for the completion of our new Hall, the work was pushed on through the summer with all expeditiousness. On the evening of the 8th of October it was opened with appropriate ceremonies. Addresses were made by Hon. George Willard, Hon. D. Bethune Duffield, and President A. D. White of the Cornell University. A large number of prominent men from various parts of the State were present. The capacity of the Hall was well tested by the great throng, who attended the exercises. About 3,400 people were comfortably seated. The acoustic qualities of the Hall are found to be good. This spacious, airy, well-lighted auditorium is of the greatest service to us.

COMMENCEMENT WEEK.

We have been trying for some years to make Commencement Week as attractive as possible to the Alumni and other friends of the University. Everything, which draws them to us on that occasion, is helpful to the Institution. The transfer of the Senior Class Day and its various festivities to the week of Commencement, proved this year a very happy change. The class showed a commendable spirit in lifting all their exercises to the high plane demanded by an occasion which calls so many to our halls to rejoice with them in their celebration. The Alumni Association also made special and successful efforts to lend interest to the week.

THE PROFESSIONAL SCHOOLS.

The work of these schools has been carried on very successfully this year. The needs of the Law Library were so pressing that at your last meeting you felt justified in drawing upon our future resources to the extent of $1900 to purchase books. The Law Department asks help for no other purpose, and it is wise to furnish all the aid we can in enlarging its library. It is to be hoped that by the erection of a new building for the General Library we may be able before long to devote the whole or a part of the first floor of the building to the uses of the Law Library. The room now occupied by it is too small for the large number of students, and ill adapted to the proper protection of the books.

Professor C. I. Walker has obtained leave of absence for one year. Mr. William P. Wells, of Detroit, has been appointed Lecturer for that period.

I have already spoken of the changes in the Faculty of the Medical School.

Arrangements have been made for much more extended instruction in Microscopy, which, owing to a lack of a sufficient number of instruments, it has not heretofore been practicable to give.

It is a matter of congratulation that a fresh interest seems to be awakened in the country in securing for physicians a higher type of education. Various methods of accomplishing the desired result are under discussion. It is conceded to be impracticable to require, as in some foreign lands, a collegiate training as a preparation for medical study. Some think that the object can be best attained by arranging the different branches of medical learning in a logical order, as we aim to arrange the studies of a college course, and finish one group in one year, another higher group in another year, and so on, instead of requiring the student as at present to hear substantially the same lectures on all branches repeated in successive years. Others hold that while the present methods are retained, rigorous examinations at the close of the course should exclude all but the most competent from graduation. Still others maintain that schools should have some genuine examination of applicants for admission, which should close the doors to those, who are so innocent, as too many medical students in this country now are, of the very rudiments of an English education. I am not aware that any school in the country, except this, does now require any preliminary examination. It would be a great step forward if all the schools would agree to insist on it, whatever changes are made in the methods of instruction, or however rigorous the examinations for graduation are made. It is as unkind to the student as it is embarrassing to the school, to retain him in the classes for two or three years, if it is clear at the outset that his ignorance of the very rudiments of learning is so dense, that he cannot proceed with his course with profit to himself or with a reasonable hope of graduating. We cannot but appeal to the other medical schools to join us in examining students for admission. For we are not blind to the fact that if we alone take this action, we may shut the ignorant out of our halls, but cannot shut them out of the profession. And all intelligent men must recognize the pressing necessity for raising the standard of medical education.

We think there is an increasing public interest in the erection of a hospital, though that interest has not yet expressed itself in a very definite form. Since the leading physicians on both sides of the Atlantic have decided that the expensive hospital buildings, which have heretofore been erected, are less desirable than the cheaper structures on the Pavilion plan, we may indulge the hope that private munificence will furnish us the desired hospital facilities, if our city, or the State should not see fit to provide them.

Last January an application was made to the Circuit Court for a mandamus to compel the Regents to appoint two Professors of Homeopathy in accordance with an act of the legislature passed at its last regular session. After listening to arguments, the Court refused the application. In July a similar application was made to the Supreme Court. Owing to the illness of one of the counsel for the Regents, the case was adjourned until the next term of the Court.*

Some of the leading dentists of the State continue to evince a warm interest in the establishment of a Dental School here. Time only deepens my conviction that we can organize and conduct one at a very slight expense to the University. I trust we shall see our way clear to take action at no distant day.

THE POLYTECHNIC SCHOOL.

I regret that we have heretofore been unable to organize fully a polytechnic school in the University, although a large part of the work undertaken by polytechnic schools is already done by us. Would it not be wise to organize the instruction of this sort, which we are already giving, in a special school? The regular work in Analytical Chemistry, in Metallurgy, in Pharmacy, in Civil, in Mechanical, and in Mining Engineering, and some of the special work in Geology, Zoölogy and Botany would properly fall into such a department, and we may reasonably hope to widen the range of our labors in these and cognate branches at no distant day.

OUR RESOURCES AND NEEDS.

The detailed report of the Finance Committee, usually appended to the printed copy of the President's Report, furnishes so full a statement of our financial condition, that I need only advert to the fact that our income last year did not suffice to meet our expenses. We may hope that the increase in the fees of students will relieve us somewhat in 1874–5. But we are pressed on every hand by the need of ample means for the large and varied work laid upon us. After a time we shall receive important help from the State. But urgent wants have already compelled us to draw upon our future resources. The expense of the erection of the addition to the Laboratory and of the supply of certain indispensable articles to the Scientific department has been met in this way. May we not cherish the hope that private munificence or the generosity of our Alumni will also enlarge her resources? Some of the older graduates have already set on foot a most laudable movement to endow the Professorship of Physics and devote the proceeds to their venerable and beloved teacher, Professor Williams, during his life. May not the graduates of the Law School do something toward increasing the Law Library, the graduates of the Medical School something directly or indirectly toward the erection of a hospital? Does not our urgent need of a new library building and of a new building for a Polytechnic School appeal to the public spirit of the liberal friends of sound learning in the State? There is not a department of instruction, which could not be greatly enriched by ampler means of illustration. We cannot but hope that private generosity will freely supplement what has been done by the generosity of the State, and that the University with its great and growing work may be no less a monument of the affection and intelligent liberality of individuals than of the wise and noble spirit of the State.

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* While this Report is passing through the press, the Supreme Court has disposed of the application for a mandamus by declining to make any order in the premises.

Respectfully submitted,

JAMES B. ANGELL,
President.

APPENDIX A.

REPORTS

From the Deans of the Professional Schools and from the Professors of the Department of Literature, Science and the Arts.

I.

REPORT FROM PROF. SAGER, DEAN OF THE MEDICAL FACULTY.

To the President of the University :

SIR,—In submitting a report of the operations of the Department of Medicine and Surgery for the academic year 1873-4, I beg leave to say that as no considerable changes in the order or method of instruction have been made since the last report, it would seem quite unnecessary to review the detailed statement previously presented. It may be deemed sufficient to state that the instruction in all the branches of study, with a single exception has been given to the classes of male and female students separately, and by a repetition of each course. But, as much of the clinical material requiring operations could be exhibited but once—so far as practicable, consistently with decorum, the class of women have been invited to be present at many of the major and most of the minor operations.

The number of students in attendance has fallen off moderately, but this is believed to be but a temporary fluctuation due mainly to the strong efforts and unwonted sacrifices of rival schools.

Of the candidates for graduation a larger number than usual failed to meet the requirements, due mainly it is fair to presume to the inadequate preparatory training, but in part also to the attempt on the part of some to pass the Rubicon without allowing sufficient time for thorough professional study. To correct this great defect in preparatory education in branches most important to the student of medicine to know, I beg to suggest the adoption of the plan pursued in the great French Schools of Medicine, viz.—the establishment of a chair of Natural Philosophy and Medical Jurisprudence. Everywhere in Europe an acquaintance with Natural Philosophy and Chemistry are regarded as alike fundamental and equally important. Much to the detriment of the medical course in this country while Chemistry has been retained, the equal claims of Natural Philosophy have been ignored and omitted. With this addition to the course of instruction this department would be independent of the graded schools of the country where at best the subject is but imperfectly taught, and a great benefit would be conferred on those seeking a thorough medical education.

The Hospital, which as heretofore the Faculty have endeavored to utilize for both student and patient, has been found to be quite inadequate to meet the wants of a great medical school, and the attention of the President and Honorable Board of Regents is respectfully and urgently invited to this defect in the otherwise almost perfect facilities for instruction in this department.

II.

FROM PROFESSOR T. M. COOLEY, DEAN OF THE LAW DEPARTMENT.

To the President of the University:

SIR,—In complying with the custom which requires an annual report from the several departments, I have only to say that the Department of Law has enjoyed during the year its usual prosperity, and that nothing remarkable in its workings seems to require mention. The total number of students in attendance was 316, and the degree of Bachelor of Laws was conferred upon 126, who had taken the full course and submitted to all the requirements. The number entering from distant States was greater than usual, and we think we notice, also, a gradual and very satisfactory improvement in the preliminary preparation.

III.

REPORT OF DR. SILAS H. DOUGLAS, PROF. OF CHEMISTRY AND DIRECTOR OF LABORATORY OF ANALYTICAL AND APPLIED CHEMISTRY.

I give four lectures per week at 5 o'clock P. M. on General Chemistry to the Medical Class during the first half of the college year, and five lectures per week, 11½ o'clock A. M., to the Junior College Class, during the last half of the college year. These lectures are accompanied by experimental illustrations requiring the entire half day for preparation on day of their delivery. I also have the general supervision and direction of the Chemical Laboratory.

Albert B. Prescott, Prof. of Organic and Applied Chemistry and Pharmacy, teaches Analytical and Applied Chemistry in the Laboratory about 3½ hours (1½ to 5 P. M.) for five days in the week during college year He also meets the classes for class drill in the recitation room, the working of chemical problems, lectures on Pharmaceutical Chemistry to students in the Pharmacy School and on Organic Chemistry to those of the Medical School, equivalent to two hours daily during the year. Hours 9½ to 10½ and 10½ to 11½ A. M.

Preston B. Rose, Assistant in Chemistry, serves as accountant and dispenser of chemicals and apparatus, and teacher in the Laboratory five hours per day for five days each week during college year. Class drill in the recitation room relating to the work of the laboratory three or four hours per week.

Otis C. Johnson, Assistant in Chemical Laboratory. Instruction in Qualitative Analysis in Laboratory at least five hours per day (1 to 5 o'clock P. M.) and a portion of A. M. for five days each week during the year. Class drill in recitation room one hour per day for five days each week through the year.

Samuel T. Douglas, Assistant in Laboratory. Instruction in Quantitative and Qualitative Analysis in Laboratory at least five hours per day (1 to 5 o'clock P. M.) and a portion of A. M. for five days each week during the year. Assistant to the Professor of Chemistry at his lectures four hours per week for first half of year, and five hours per week for last half. Recitations of Junior Pharmacy class two hours per week.

Robert M. Cotton, Assistant in Laboratory. General work and teaching in Laboratory five hours per day (1 to 5 o'clock P. M.) for college year.

Otis B. Dickinson, Assistant in Pharmacy. Instruction in Pharmaceutical Manipulation in Laboratory.

IV.

REPORT OF DR. H. S. FRIEZE, PROFESSOR OF THE LATIN LANGUAGE AND LITERATURE.

To the President of the University:

SIR,—The course of studies in the Latin Language and Literature is pursued by the members of the four undergraduate classes who are candidates for the degree of Bachelor of Arts and Bachelor of Philosophy, and also by such students in selected courses, or in post graduate courses, as may elect the study of Latin. During the last academic year the whole number engaged in this study has been *two hundred and thirty-five*, twenty-one in the senior class, fifty-six in the junior class, fifty-five in the sophomore class, ninety-seven in the freshman class, and six in selected courses. In the senior class the study of Latin is elective, and pursued largely by those who have in view the profession of teaching. The whole number above mentioned has been divided, for the purpose of more efficient instruction and drill, into eight sections: three of freshmen, two of sophomores, two of juniors, and one of seniors.

The three sections of the freshman class have had exercises daily throughout the year, under the charge of Instructor Blackburn. The Latin texts employed in this class have been the de Amicitia of Cicero and the twenty-first and twenty-second books of Livy. The study of these has been accompanied by a careful review of the Latin grammar, frequent exercises in the Latin Prose Composition, and, during the second semester, by one lesson weekly in Roman history. Although the requirements in Latin for admission to the freshman class have been gradually advanced, and the average grade of scholarship actually attained in the High Schools is very much superior to that of former years, it is still necessary to make the work of our first year largely elementary, and to give much time to the details of grammar.

In the instruction of the sophomore class we are enabled to give more attention to literary criticism, and to the characteristics of the authors whose works are studied. The two sections of this class have been under the charge of Assistant Professor Walter. They have had recitations or lectures daily through the first semester, and to the middle of the second semester. The authors studied have been Horace, Terence, and Juvenal. Critical attention has been given to the Prosody, and to all the collateral investigations and readings, necessary to the elucidation of the text, and to the thorough understanding of these important writers.

The faithful and thorough work of the Instructor in Latin in the freshman class, and the broad and scholarly character of the teaching of Assistant Professor Walter in the sophomore class, have done much to advance this branch of academic studies, and to make it possible to give to the study of Latin in the junior and senior years a more decidedly university character. The exercises of these two classes, embracing two sections of juniors and one of seniors, have been conducted by the undersigned. The Latin of the senior section has alternated throughout the year with the Greek. The juniors have had two daily recitations and lectures during the second semester. The authors studied have been, in the junior class, Quintilian, and in the senior class, Tacitus and Pliny the Younger. The instruction has been given partly by recitation and partly by lectures. The lectures, besides those on the classical texts, have been chiefly on Roman history, and comparative Philology. Opportunity has been given to the members of the senior class who desired to prepare themselves for teaching Latin, to direct their studies especially to that object. One half of the section have adopted this course, and have passed examinations proving their qualification for such work. It is hoped that this special training will now be established as a part of the work of the senior year, and that it will contribute to the improvement of the Latin course in the preparatory schools.

V.

REPORT OF E. OLNEY, PROFESSOR OF MATHEMATICS.

To the President of the University:

SIR,—During the academic year, beginning September 24th, 1873, there were three Instructors employed in the department of Pure Mathematics, besides the Professor in charge. These Instructors had charge of the daily recitations of the Freshman class in Algebra, Geometry and Trigonometry, and of several sections of the Sophomore class in Trigonometry and General Geometry. The current year there is one less Instructor, but the enlarged experience of Mr. Beman, who has been advanced to the rank of Assistant Professor, relieves the head of the department of some labor and responsibility which the employment of a less competent man would entail. Could the work in the department be distributed uniformly through the year, this amount of teaching force would be quite adequate; as it is, however, the work is accumulated in the first part of the year, during which the sections are too large, and the labor required severe, while in the latter part of the year the work is much less.

It is desired that no section of the Freshman or the Sophomore class shall number more than twenty for daily class drill; but, in consequence of the unequal distribution of work alluded to above, we are at present obliged to have somewhat larger sections.

The Freshmen are reviewed weekly by the Professor in charge. The Sophomores were also so reviewed last year; but these reviews are discontinued this year in consequence of the ample qualifications of their instructor.

A determined effort has been made for several years past, to secure such measure of preparation in Mathematics that the Freshman class can complete both Plane and Spherical Trigonometry. In order to this a complete elementary course in Plane, Solid, and Spherical Geometry, and a knowledge of Algebra through Quadratics, Ratio, Proportion, and the Progressions, are required for admission to this class. Nevertheless, we have not been able, as yet, to get such thoroughness of preparation in these subjects as enables us to accomplish the end. Last year the Classical and Latin and Scientific Freshmen did nothing in Trigonometry, and the Scientific section, having six weeks more time, completed only Plane Trigonometry. Two things are indispensable to the success of this plan: First, that the Classical and Latin Scientific sections should have a full year for Freshman Mathematics; and, second, that more thorough work should be done in our Preparatory Schools.

In connection with the last suggestion, I cannot forbear to remark at how great disadvantage the higher mathematical studies are placed in many of our Preparatory Schools. Mature students need a full year for preparation in Algebra, with a term for final review just before coming to the University, and an equal amount of time for Geometry. Young, or immature students require more. Yet few of our schools allow this amount of time, and it is quite common to suspend all mathematical studies for two or three years while the pupil is "preparing for college," that is, studying Latin and Greek. If to this we add the fact that it is thought indispensable that the classical teacher in our Preparatory schools should be a man, thoroughly educated, while not unfrequently the mathematical instruction is given by whomsoever may chance to have time for it, or can be secured at at lowest rates, we need not look further for an explanation of the facts deplored. No Preparatory School should think of fitting for the University without a Mathematical Teacher equally trained and competent with its Classical Teacher; and no student should be commended to us, who has not had a thorough review or examination upon his mathematical studies during his last preparatory year.

VI.

REPORT OF C. K. ADAMS, PROFESSOR OF HISTORY.

To the President of the University:

For the purpose of giving a better view of the progressive order in which the individual students receive their instruction in history, I begin my report with an account of the studies pursued during the past year by members of the

FRESHMAN CLASS.

The Classical section of this class received about forty lessons in Grecian History, and about half that number in the History of Rome. The text-books used were those of Smith and Liddell. Roman History was also pursued to the same extent by students of the Latin and Scientific Course. An especial effort was made to familiarize the members of the class with such facts in the History of Greece and Rome as had an influence on the constitutional development of those nations. To the members of the Scientific, and of the Engineering Course, forty lessons in the History of Greece were given by Professor Hutchins; and these lessons covered a period similar to that studied by students in the Classical Course.

SOPHOMORE CLASS.

In the course of the first semester, classical students received eighteen lessons in Grecian History. These were devoted especially to a study of the Mythical Age and to the History of Greek Literature. In the second semester about one half of the Classical students, and about the same proportion of the members of the Latin and Scientific class, elected the historical course. To these, as well as to the whole of the Scientific class, lectures were given by myself, on the History of Modern Europe. These lectures were sixty in number, and were devoted to the period between the time of Dante and the end of the Thirty Years' War. In addition to these lectures, the members of the Scientific section of the class received forty-five lessons in Roman History, under Professor Hutchins.

JUNIOR CLASS.

To all the students of this class, excepting those in Civil Engineering, thirty lessons were given by myself in Mediæval History, the text-book being Guizot's History of Civilization in Europe. The Latin and Scientific members of the same class received from Professor Hutchins sixty lessons in the History of Greece.

SENIOR CLASS.

The historical studies of this year are wholly elective. During the first semester, thirty-six members of the class elected the Constitutional History of England; and during the second semester, forty-two elected the Constitutional History of the United States. The method of instruction was that adopted three years since, in imitation of the *Historische Gesellschaft* of the German universities. It differs from the methods pursued in the earlier parts of the course, chiefly in the fact that it is designed, not so much to impart actual instruction, as to direct the student in the work of original historical investigation. In regard to the success of the method, it is only necessary to add to what was said in my report of 1872, that it has continued to be used with highly and increasingly satisfactory results.

For the purpose of presenting more distinctly the amount of history studied by each of the classes during the whole of the course, the accompanying table is given. The figures carried out refer to the number of lectures or recitations of one hour each.

		Classical Course.	**Latin and Scientific.**	**Scientific.**
FRESHMEN.	1st Semester.	History of Greece..20 " " Rome... 4	Roman History...... 4	History of Greece. 45
	2nd Semester.	History of Greece..20 " " Rome...18	Roman History......18	
SOPHOMORES.	1st Semester.	History of Greece..18		History of Rome.. 45
	2nd Semester.	Modern History (Elective), ...60	Modern History, (Elective)..........60	Modern History.. 45
JUNIORS.	1st Semester.	Mediæval History..30 Grecian " .. 4	Mediæval History...30 History of Greece....60	Mediæval History. 30
	2nd Semester.	Roman History....15	Roman History......15	
SENIORS.	1st Semester.	Constitutional History of England, (Elective)........36	Constitutional History of England, (Elective)..... 36	Constitutional History of England, (Elective)..... 36
	2nd Semester.	Constitutional History of the U. S., (Elective)........28	Constitutional History of the United States, (Elective).. ..28	Constitutional History of the U. S., (Elective)..... 28

From this tabular view it will be seen that the whole number of lessons received by the students of the respective Courses is as follows:

	REQUIRED.	ELECTIVE.	TOTAL.
CLASSICAL STUDENTS	129	124	253
LATIN AND SCIENTIFIC STUDENTS	127	124	251
SCIENTIFIC STUDENTS	165	64	229

It remains to be added that the instruction of the Classical students, in both the History of Greece and the History of Rome, was given by the Professors and Instructors of Greek and Latin respectively; and that it is embraced in this report only for the purpose of showing the amount of history studied by the various classes.

Professor Hutchins was employed with the Sophomore and Freshman classes one hour a day during the whole of the first semester, and with the Latin and Scientific section of the Junior class one hour a day during twelve weeks. During the first semester, with the exception of the first two weeks, I was myself occupied with the Seniors who elected history, eight hours a week; and during the second semester, six hours a week, this amount of time having been rendered necessary by the number of students who elected history, and the consequent division of the class into sections. In addition to the work with the Senior class, I had one daily recitation with the Junior class during twelve weeks of the first semester; and one daily lecture to the Sophomores who elected history, during the same number of weeks in the second semester.

VII.

REPORT OF DR. B. F. COCKER, PROFESSOR OF PHILOSOPHY.

To the President of the University:

SIR,—The Professor of Mental and Moral Science begs to report as follows:

The instruction in his department for the years 1873–4 embraced Psychology, Logic, Ontology (Philosophy proper), History of Philosophy, Ethics, and Evidences of Christianity.

This is a large field, and the desideratum is to compress into a small compass a thorough and systematic presentation of these subjects, so that the student shall obtain a fair knowledge of the fundamental principles, and be trained in the methods of the study, so that he may be enabled to pursue the inquiries more fully in after life if he so desire. He has therefore found it necessary in a great measure to abandon the use of text books, and furnish the instruction chiefly by lectures, indicating such matter as he requires the student to commit to writing, referring to text-books and monographs where the subjects are more fully discussed, and then regularly examining the student's notes. The lectures are delivered in the morning hour assigned for him, and an examination or "quiz" is held twice a week in the afternoon. The results are satisfactory to his own mind, and he is convinced that this method is better than the use of *one* text-book, inasmuch as it enables him to present more fully the fruits of his own studies, and to keep the student more thoroughly abreast of the thought of his times. He makes no pretension to perfect success; but he feels that every year shows some improvement, and he trusts the fruits are seen in the disciplining afforded, and in the body of truths carried away by the student.

VIII.

REPORT OF M. L. D'OOGE, PROFESSOR OF THE GREEK LANGUAGE AND LITERATURE.

To the President of the University:

SIR,—I have the honor to present you the following report of the work done in the department of Greek, for the year 1873–4.

The instruction of the Freshman class, and of the Sophomore class for nearly the whole of the first semester, was given by Assistant Professor Pattengill. In the first semester, the Freshman class read the selections from Thucydides contained in Boise and Freeman's "Selections from Greek Authors," being about 40 pages of text, and had about thirty lessons in Smith's History of Greece, embracing the Persian and Peloponnesian wars. Abstracts of the Thucydides were also written. The class was divided into two nearly equal sections, the one composed of those admitted on diploma from preparatory schools, the other of those admitted on examination. The "diploma", section pursued the study of the Syntax in Hadley's Grammar; the other commenced the grammatical work at the beginning. In the second semester, the Panegyric Oration of Isocrates and the third Olynthiac Oration of Demosthenes were read. Written abstracts of both these orations were made by the pupils. About ten recitations were devoted to the period of Greek history from the last part of the Peloponnesian war to the Macedonian supremacy. The diploma section studied Goodwin's Greek Moods and Tenses; the other the Syntax in Hadley's Grammar.

The Sophomore class read, in the first semester, four books of the Iliad and one of the Odyssey, and wrote essays on the Homeric Age, Epic poetry, and the Homeric Question. For six weeks, one section of the class received instruction from the Professor. With him also the entire class had one lesson each week in the history of Greek Literature and Art. In the second semester Greek makes but half a study. The Antigone of Sophocles was read; essays on the Greek drama and analyses of Greek tragedies were written, read in the class, and criticised.

By the new schedule of study that makes Greek elective for the Senior year, the time devoted to this study in the Junior year has been increased, greatly to the satisfaction of the instructor, from twelve weeks to fifteen. In this time the class have been able to read with satisfaction Demosthenes' Oration on the Crown and Plato's Apology, giving thirteen weeks to the former, and two to the latter. In connection with the study of Demosthenes, the class presented essays on the Attic Orators, and on ancient, as compared with modern, oratory.

The results of the first trial of the elective system in the Senior year have been most gratifying to the department of Greek. Out of thirty-four classical students, fourteen elected Greek the first semester, seventeen the second. All worked with the enthusiasm and energy that ever attend voluntary effort. The studies pursued during the first semester were these : the Prometheus of Æschylus, with special reference to the principles of the Greek drama; in this connection lectures were given on the origin and development of Greek tragedy, on the Age of the Tragedians, and on the different schools of Lyric poetry. Nearly the entire oration of Æschines against Ctesiphon was read in a cursory way. In the second semester, the class read the Acharnians of Aristophanes, and had presented to them a general survey of the Greek Comedy, with special reference to the social and political condition of Athens before and after the Peloponnesian war.

IX.

REPORT OF G. S. MORRIS, PROFESSOR OF MODERN LANGUAGES AND LITERATURE.

To the President of the University :

SIR,—I take pleasure in reporting upon the work of the Department of Modern Languages as follows: Instruction has been given in the three languages, French, German and Italian. Two Instructors have been employed during the year in teaching French, and one in teaching German. I have also instructed in both of these languages and in Italian.

I. *French.*—Since the date of my last report the requirement of a knowledge of French grammar, and of some facility in reading easy French as a condition of admission to the University, for Scientific and Latin Scientific students, has been enforced. The results have been more and more satisfactory from year to year. A circular signed by the head of this Department was issued and forwarded to many superintendents of schools and teachers of French in the State, calling attention to points on which special stress would be laid in the examination of candidates for admission. It is but due to those teachers to state that in the recent examination of candidates a standard of acquirement was found to have been attained, which was far in advance of what the first two similar examinations developed. With students already well grounded in French grammar, it has been found possible to advance rapidly to a much higher grade of instruction than formerly. But a rapid review of the subject of pronunciation and of important parts of grammar always precedes, at the beginning of the course in the University, the entrance upon advanced work.

The Latin-Scientific Freshmen, reciting in two sections daily to Monsieur de Pont, learned, in the first semester, the Syntax from the Grammaire française de Noel et Chapsal, read Xavier de Maistre's Voyage autour de ma Chambre, studied French idioms on the basis of William's "English into French," and had constant drill in French expression. French was at once introduced as the language of the class-room. In the second semester the same section read a play entitled, La Poudre aux Yeux, translated into French about ten pages, of ordinary size, from Dickens's Tale of Two Cities, and had practice (as also in the preceding semester) in the writing of French compositions.

The Scientific Freshmen recited in two sections to Monsieur Hennequin. The work of the year is itemized by him as follows:

1. Review of the work done in preparation.
2. Study of irregular and defective verbs.
3. Syntax, with written exercises.
4. Familiar and Scientific reading (100 pages).
5. Idiomatic Tables (200 pages of Chardenal) with oral exercises.
6. French Essays; one every two weeks.
7. Colloquial Exercises; one every two weeks.
8. Translation from Dickens's Christmas Stories into French; 10 to 15 ordinary pages.

The text-books used were Chardenal's French Exercises for advanced Students, Herrig's La France Littéraire, and Hennequin's French Verbs. The practical ends aimed at were the same as with the Latin-Scientific section.

The Latin-Scientific Sophomores finished their course in (required) French in the first semester, reciting to me. Their work consisted of reading or reciting the whole of Brachet's Grammaire historique de la Langue française, translating the Athalie of Racine, and turning into French an English play of 22 pages. With this were combined the constant learning and practice of idioms, an introduction to French etymology, and practice in composition. Some hints on the history of French literature were given in a few hours set aside expressly for this purpose. This class was the first one which had been required to pass an examination in French as a condition of entrance into the University, and the increased measure of acquirement to which it was possible to bring its members at the end of their required course in French illustrates happily, in all respects, the wisdom of the requirement.

The Scientific Sophomores were left in the charge of M. Hennequin during the first semester of the academic year and were instructed in translation from English into French, and *vice versa*, in syntax (with exercises), in idiomatic exercises (oral), and in French composition (one essay per week). During the first half of the second semester a similar course was pursued with them, except that their recitations in translation were to the writer of this report.

The Classical Juniors were under the care of Monsieur de Pont. The same variety of work was accomplished with them as with the other classes. Considering that this section *begin* the study of French in the junior year, and devote only four-fifths of the year to the study, the amount of work accomplished must, I think, be considered highly satisfactory (some 100 pages of French read, several pages of English translated into French, together with the learning of the substance of the French grammar, and practice in French expression, oral and written.) But it is felt to be a great occasion of regret, and of self-reproach on the part of the head of the department, that he acceded to the shortening by two-fifths of one semester, of the course of this section in French.

Advanced French was offered as an elective study to the Latin-Scientific Seniors in the first semester and to the other sections in the second semester. Classes were formed, numbering in the first semester 16, and in the second 22, and were instructed by me. The work done was principally translation, with daily and constant practice in conversation, or in French expression.

II. *German.*—There were three classes in German throughout the present year, and one during three-fourths of the year. The writer of this report had constantly one class under his own instruction; the other classes were efficiently conducted and taught by Dr. Frank A. Scott. The Sophomore Engineers and Scientific and Latin-Scientific Juniors, pursuing German as a required study, learned the contents of Whitney's Grammar and read considerable portions of Whitney's German Reader (54 and 56 pages respectively). The Juniors read, in addition, Lessing's Minna von Barnhelm. The Classical Seniors (22 in number) electing German learned the Grammar from the same book, and read 30 pages in Petermann's Literaturgeschichtliches Lesebuch, in the first semester, and, in the second (to the writer) recitations from the first Part of Goethe's Faust. The Latin-Scientific and Scientific Seniors (in the first semester about 24 in number, in the second 14), electing advanced German, read Goethe's Iphigenie (to the writer) and Grimm's "Venus von Milo," and "Raphael und Michael Angelo" (to Dr. Scott). They were also, like the other classes, extensively drilled in translation into German and oral expression in the same language.

About 10 hours were devoted by me to lectures on the history of German literature, before the Seniors who elected German. Fricke's Tabellen zur Geschichte der deutschen Literatur und Kunst were purchased by the students and were employed as a basis or outline for the lectures.

III. *Italian.*—A class of 34 Seniors, who elected Italian, were instructed by me, 30 lessons being devoted to the study. The main parts of the Grammar were learned, together with the pronunciation of Italian, and about 25 pages of Le mie Prigioni by Silvio Pellico were translated.

The average number of hours of instruction given daily, throughout the year, in this department, was 10½. This number is slightly less for the past year than for the years immediately preceding, owing to the exceptionally diminished size of the Scientific section of the Freshman class. It should be noted, however, that the time daily given by Instructors to the correction of exercises and essays in the foreign languages, at their homes, has been very considerable, amounting on an average to from one to two hours daily, in addition to the time absorbed in preparation for recitations.

A considerable number of persons from other departments (about 15 in all, principally students of Law and Pharmacy) have recited with the classes of this department.

The gentlemen who have assisted as Instructors in the work of the department have labored with the greatest zeal, and the students in the respective classes have shown, with rare exceptions, a corresponding spirit of earnest, manly industry.

X.

REPORT OF CHAS. E. GREENE, PROFESSOR OF CIVIL ENGINEERING.

To the President of the University :

SIR,—I have the honor to submit the following statement of work done in my department during the year 1873–4.

The Scientific Freshmen were instructed in Geometrical Drawing, by Assistant Prof. J.B. Davis and Mr. C.S. Denison, during one half of the first semester. They numbered twenty-seven. Warren's Plane Projection Drawing was used as a text-book, but it was supplemented by oral instruction. Near the close of the year those of the Freshmen who proposed to take the Civil Engineering course received thirty lessons from Instructor Denison in Lettering and Ornamentation.

The Scientific and Mining Engineering Sophomores studied Surveying for three-fifths of the first semester. They were instructed by Prof. Davis, partly from Gillespie's Land Surveying and partly by lectures and drill in in the theory and use of instruments. The class numbered eighteen. They had field practice during suitable weather, in simple surveys and in obtaining data for determining inaccessible distances.

The same section studied Perspective Drawing and drew problems in that subject, during the last half of the second semester, under the supervision of Mr. Denison.

Mr. Denison also instructed the Latin-Scientific Sophomores, eighteen in number, in Descriptive Geometry, for one-half the second semester, using Church as a text-book, in place of Davies as heretofore. The class drew all the problems.

The Junior Civil Engineers, under the charge of Prof. Davis, studied, during the second semester, what is now called in the Calendar "Higher Surveying." They went over Rankine's Civil Engineering, Part I., and so much of Part III. as is devoted to railroad construction and equipment; Henck's Field Book for Engineers; and also heard lectures on working methods. The class had practice in determining the azimuth of a line and in running railroad curves. Near the close of the year they were taken out of town for a fortnight continuously, to a suitable place near Whitmore Lake. A rough portion of ground, giving a line of about a mile and one half in length, was purposely chosen, so as to afford useful practice in difficult instrumental work, and each member of the class, some twenty in number, took his turn in each of the different positions in a railroad party. This work has up to this time been done in the Senior year. The success of the experiment of taking the students into the field warrants its continuance, and four weeks will hereafter be devoted to such work by the Junior Engineers. The possession of tents and other camp equipage would enable the surveying party to choose its ground without reference to the accessibility of a boarding place.

The Juniors, Scientific and Civil Engineering sections, received instruction in Shades, Shadows, and Perspective, and worked in the drawing room under Mr. Denison, during all but six weeks of the first semester. The Junior Engineers also studied Stereotomy with Mr. Denison, four weeks in the second semester, using Mahan's Stone-Cutting. The Senior Engineers pursued the same study under the same Instructor.

The Senior Civil Engineers, fourteen in number, were in a great measure in my charge. During the first four weeks of the year they were exercised, for about eight hours per day, in a similar railroad survey to the one above described as carried on by the Juniors. They made the preliminary and location surveys, cross-sectioned, took the topography, calculated the earth work, and drew a complete plan from their field notes, and from them exclusively, thus doing all possible work previous to actual construction.

Subsequently the Senior class took up the Theory of Construction, using Rankine's Civil Engineering, Part II., and subsequently completing Part III. Much additional matter in the way of fuller explanation and illustration of American practice with lectures on

Graphical Methods was also given them. This course was finished with the year. The class, during the first semester, also studied Wood's Resistance of Materials. In the second semester they attended lectures twice a week on Machinery, Water-Wheels, the Steam Engine, and kindred topics. About one half of the section elected Engineering Design in the second semester, worked out problems and made drawings of roof and bridge trusses.

Owing to some very decided changes in the arrangement of the course of study for students in Civil Engineering, the work of the instructors in this department has been somewhat less than usual the past year. There were fewer classes in Descriptive Geometry, and no instruction was given in Machine Drawing, that work having been carried forward from the Junior to the Senior year. The new course has been so fitted to the old that all the classes have now entered upon the new scheme.

Some new instruments have been added during the year and have been found of great service in the field practice. A few more have been purchased. Some repairs were made at the commencement of the year, upon one of the six rooms occupied by this department, and, during the vacation just passed, two recitation rooms were completely renovated, and a small room was fitted up for the safe-keeping and display of the surveying and engineering instruments. An order has been sent to Carl Bock, of Dresden, for some models in bridge construction, which will be a valuable addition to the present small nucleus of a collection. Photographs of public works, etc., are also expected from Paris. Several bridge building companies in this country have, on application, supplied the University with photographs and lithographs of their constructions, the American Bridge Co., of Chicago, especially, sending a very fine album of views, and the Baldwin Locomotive Works of Philadelphia have forwarded four handsome framed photographs of locomotives.

XI.

REPORTS OF DR. HILGARD, PROFESSOR OF MINERALOGY, GEOLOGY, ZOOLOGY AND BOTANY, AND OF M. W. HARRINGTON, ASSISTANT PROFESSOR IN CHARGE OF ZOOLOGY AND BOTANY.

To the President of the University:

Sir,—I herewith respectfully submit the following summary of the courses of instruction in my department during the past session. I recall to mind that the operations of the Museum, as well as the needs and general interests of my department have found discussion in a previous report.

In our courses as at present organized, the study of Mineralogy, Lithology and Geology can be logically placed only in the senior year, where it has been preceded by the indispensable preliminary doctrines of Physics and Chemistry. The time heretofore allotted to Mineralogy and its necessary concomitant Crystallography, in connection with the Chemical course, being obviously inadequate to the requirements of the courses of Lithology and Geology, these subjects have, by agreement with Dr. Douglas, been transferred to my department, and my plan has been to devote all the available time of the first semester to Crystallography, Mineralogy and Lithology; the second semester to Geology proper.

Holding that in order to be successful, instruction in the objective sciences must proceed as nearly as possible on the methods of actual inductive investigation, viz: the logically consecutive *demonstration* of facts, whose merely verbal announcement makes and leaves but little impression upon the mind of the student, I have made it a point not only to illustrate my lectures copiously with figures and specimens, and from time to time to devote one or more hours exclusively to their determination by the classes; but I have also placed sets of specimens in the lecture room, accessible to students, so as to serve for study, or preparation for recitation or examination, in lieu of the text-book.

The interest thus awakened, and the progress made, have been very satisfactory, notwithstanding the unwieldy size of the classes, and the difficulty of dividing them into sections, in consequence of the elective feature. The successful instruction of such large classes (imperfectly prepared as they are in this country) in objective science, is most difficult, and necessitates the employment of the most perfect and ample means of demonstration, which as yet we do not possess to an adequate degree. I cannot but recur with satisfaction to the fact, already alluded to in a previous report, that the magic-lantern slides, so useful in this respect, have largely been prepared by the voluntary efforts of members of the late Senior class. A most valuable addition to the stock of such illustrations has also been made through the generous donation of 75 photographic slides, by Professor C. F. Hartt, of Cornell University.

Additional facilities for full and convenient illustration during the coming season, will also be afforded by the assignment of separate lecture rooms for the three distinct subjects of Geology, Zoölogy, and Botany, and the arrangements for rendering the Museum accessible for study during during the winter months, by a proper provision for heating the same.

It is to me a standing source of regret that the time allotted to the study of the sciences falling within my department, is so limited as to render a satisfactory thoroughness in any branch quite impossible. It is to special post-graduate courses that students must look for that special knowledge which alone can entitle them to be considered as professionally qualified. The demand for such higher instruction is continually increasing, both here and elsewhere; but without an increase of the staff of instructors, no great efficiency in this direction can be attained.

The division of time has been, during the first semester, two-fifths for Zoölogy, and three-fifths for Crystallography, Mineralogy and Lithology; during the second, two-fifths for a higher course in Botany, and three-fifths for Geology. In view, however, of the absence of a large demand for an advanced course of Botany, I have during the last semester of the past session, devoted the full week to Geology, those electing Botany joining in with an advanced class connected with the course in Pharmacy.

I have also given separate courses in Crystallography and elementary Mineralogy, first to the Pharmacy class, and subsequently to those entering the course of Geology at the beginning of the second semester, without a previous knowledge of Mineralogy. It is very desirable that it should be more generally understood, that the successful study of Geology is absolutely dependent upon a preliminary knowledge of Physics, Chemistry, Crystallography, Mineralogy, Lithology, and Botany and Zoölogy to the extent needed in Palæontology. To enter upon a course of Geology without such knowledge, is very much like attempting a course of Analytical Mechanics without a previous study of Arithmetic, Algebra and Geometry.

Professor Harrington's report on the operations of the courses of which he has special charge, is subjoined herewith.

E. W. Hilgard, Ph. D., Professor of Mineralogy, Geology, Zoölogy, and Botany:

SIR,—The labor falling to this department is of two kinds: that of instruction and that relating to the care of the Museum. This report refers only to the former. A full report on the latter was made to you in June last, and printed with the Proceedings of the Board of Regents.

The labor of instruction in Zoölogy and Botany during the past year has been greater than ever before. One of the courses has been enlarged, and one new course added. The method of instruction employed takes more time for preparation for each recitation than heretofore. The aim is to teach the student the scientific method and spirit as well as the facts of science. He is taught as far as practicable to look to nature, rather than to text-books, for his facts and principles. The student is plentifully supplied with specimens, and expected to familiarize himself with them. So far as our means permit, every point is illustrated by specimens.

In Botany, the elementary principles are first laid down, and the student is then set to work on the plants themselves. He is expected to be able to describe each plant accurately before he turns to his text-book. Each student is given at least one opportunity to make such a description before his class. It is thought that this work affords a most excellent mental exercise, which he cannot obtain so well anywhere outside of the sciences.

The course of Botany for students of Pharmacy has been enlarged from ten weeks to one semester. It is the intention to make the course practical by familiarizing the student with indigenous medicinal plants and teaching him how to determine drugs of vegetable origin by their structure.

The Botany of the Freshman class has been pursued as heretofore. The course is too short to be of much value. The entire Freshman class, except students in Civil Engineering, come into my hands at that time. With the method pursued it is impossible to do good work with large sections. The number of classes is therefore too large, and the pressure of work in Botany for the last six weeks of the year is too great. I have had as many as seven recitations a day during that time.

The only way to relieve this pressure is to have a hot-house in connection with the University. By means of it the botanical instruction could be spread out through the year. The hot-house is very desirable for another reason. With it, we could collect the most interesting economical plants of the world, and have them here living for the examination of students in Pharmacy and Medicine.

In Zoölogy, the usual Junior Scientific and Senior Elective courses have been given. A room on the fourth floor, close to the zoölogical collection, formerly a room for duplicates, has been cleared out and used as a recitation room. Sixty-three feet of cases have been put up in it, and the specimens intended for class-room use have been arranged in them. It has been found that this arrangement increases the interest, and adds much to the work done.

The Senior course is given with special reference to Palæontology, as a preparation for Geology.

An advanced course in Comparative Anatomy and Physiology has been added. It is intended for students who propose to teach science, and those who propose to study medicine. In this course the student does much practical work, and is expected to make some original investigations. A set of six fine illustrative skeletons has recently been purchased for this course. Through the courtesy of the officers of the Medical Department, this class will be enabled to do some of its practical work to great advantage in the Medical Building.

On the whole, the past year has been one of unusual activity in Zoölogy and Botany.

XII.

REPORT OF MR. G. B. MERRIMAN, ADJUNCT PROFESSOR OF PHYSICS.

To the President of the University:

SIR,—In the department of Physics, the supply of new apparatus and the completion of the new lecture-room during the past year, have greatly increased the facilities for experimental illustration, the lack of which has hitherto been so severely felt. The interest manifested by the classes generally, and the proficiency attained in the subjects studied, were very satisfactory.

Instruction was given daily during the first semester to the members of the Junior class and a few others, numbering in all 114, in the subjects of mechanics, acoustics, and optics, and daily the second semester (less four weeks) to 24 students of the Engineering course in Theoretical Mechanics.

The subjects of the first semester were taught both mathematically and experimentally, using for a text-book Deschanel's Natural Philosophy, which meets our wants much better than any other work used heretofore. Many of the subjects, particularly the fundamental principles of motion and force, a clear understanding of which is so essential in the subsequent parts of the study, were much more fully presented and applied than in the text-book. Much importance is attached to the application of the principles to the explanation of familiar phenomena and to the solution of practical problems, frequent exercises of this character having been required. The class was divided into two sections, which, the greater part of the time, were met separately for the purpose of more thorough instruction. For general lectures and the more important experiments, the two sections were met together. The members of the class were required to present for examination their notes of the lectures, and written solutions of the problems given.

In Theoretical Mechanics we last year used Vol. I. of Weisbach's Manual of the Mechanics of Engineering, a very valuable work for the student's library, but in some respects not so well adapted for class room instruction as is desired. Of this work the class completed and reviewed the most of sections I., II., III. and V., chaps. 1 and 2 of section VI., and chap. 1 of section VII.

While much importance is attached to the logical demonstration of physical principles, yet the success of the instruction in elementary Physics very largely depends on the number and kind of experimental illustrations. No mere description can convey so clear and accurate a conception of either phenomena, or instruments and mode of investigation, as is gained by witnessing well selected experiments, which furnish both the foundation and confirmation of theory.

The need of additional apparatus is urgently felt. The appropriations made for the department have been judiciously expended, but were very inadequate to meet the wants of the lecture room. Considerable apparatus has been constructed here under my immediate supervision, which, though not so highly finished, yet answers its purpose quite as well and at much less expense than if procured of a professional manufacturer.

For class laboratory work, which I believe it is contemplated soon to provide for, some special apparatus will be needed, for details of which (including the estimated expense) I beg leave to refer you to my communication to the Honorable Board of Regents at their meeting in June, 1878. The importance of such practical work in this department, and the great desirability of beginning it as soon as means therefor can possibly be provided, I am sure you thoroughly appreciate.

XIII.

REPORT OF MR. LESLIE IRVING, ACTING PROFESSOR OF THE ENGLISH LANGUAGE AND LITERATURE.

To the President of the University:

SIR,—In compliance with your request, I have the honor to furnish the following statement of work in the Department of the English Language and Literature during the past year.

The instruction of the Freshman class in the English Language, and in English Exercises and Elocution, and also of the Classical section of the Sophomore class in essay writing, was under the charge of Assistant Prof. Hutchins, throughout both semesters.

The members of the Scientific section of the Freshman class were engaged in a daily study of the English Language during two-thirds of the second semester. The greater part of the time was devoted to a critical examination of two of Shakespeare's plays, *Julius Cæsar* and the *Merchant of Venice*. It was the aim of the teacher to place before the class a brief outline of the marked and interesting facts in the history of the Elizabethan era, to call attention to the beauties of Shakespeare and to the peculiarities of his English, and to point out differences between Elizabethan English and the English of to-day. Some time was also given, at each exercise, to grammatical criticism, to pronunciation, and to a careful study of words.

All students belonging to the Freshman class had a weekly exercise in English, which extended throughout the year. For this work the class was divided into three sections. The instruction was given principally by lectures. *The Origin and History of the English Language* was the subject of the lectures of the first semester. The second semester was spent in the study and practice of Elocution. Lectures were given upon the subject; and in order that individual drill might be secured, the critical reading of Shakespeare was introduced during the last half of the semester. The students were required to take notes upon all lectures, and to pass an examination upon the same and also upon all subjects which came up for consideration before the class. In addition to the above described work, a declamation and an original speech were required from each member of the class. The speeches were criticised by the teacher before delivery, and all errors and improprieties in the use of language pointed out to the student.

The plan pursued by Prof. Hutchins with the Classical section of the Sophomore class in essay-writing and essay-reading, was substantially the same as that followed by myself with the other sections of the class; it will be described hereafter.

It is proper to state that during the year Prof. Hutchins criticised 118 speeches and 205 essays.

Under my own charge were the Junior speeches, and the essays of the Scientific and Latin and Scientific sections of the Sophomores. These were carried on through the entire year. Each member of the Junior class was called upon to write, in the course of the year, five original speeches, which were handed to me for examination, and after careful correction and criticism, were returned to the writer, and by him committed to memory and delivered. For the purpose of the essays, the Sophomore class was divided into small sections, which met separately, one in each week, to read essays. Each section met twice, for each essay required; once to read, and once for the purpose of criticism. On these occasions, each essay was taken up in turn, and criticised for the benefit of the entire section, and became in fact the subject of a sort of rhetorical parsing. It is believed that in this manner more thorough and profitable critical work was obtained than was practicable under the system formerly employed. Each member of the class furnished five essays in the course of the year. The combined work of speeches and essays occupied one hour per day in the class room, and about two hours per day were found necessary for the proper examination and correction of the manuscripts. In all, 492 speeches and 281 essays were thus read and criticised by me. I include in this number thirty-four speeches and nine essays received from members of the Senior class, who from some necessary cause—in most cases "unavoidable absence"—had been unable to complete them in their proper course.

Instruction in Rhetoric was given by me to the Engineers of the Sophomore class for three-fifths of the first semester. Bain's Rhetoric was employed as a text-book, and short lectures, illustrative and explanatory, were given in connection with each recitation. The time occupied in the class room, for this course, was one hour per day, and about double that time in the necessary preparation. In the second semester the remainder of the Sophomore class received instruction in Rhetoric, for which purpose they were divided into two sections. The same text-book was employed as in the previous course, but in addition seven full lectures, of one hour each, were given to each section. On these the class took notes, and recited in the same manner as upon the text. Two hours per day were occupied in the class room in this semester, and the same amount of time in preparation. In consequence of the intended absence of Professor Watson, the portion of the second semester allotted to the study of English Literature was given to Astronomy, and the work of this department has therefore been to that extent lighter than usual. In the next year the case will be reversed, and provision must be made for two full courses of English Literature—one for the Junior and one for the Sophomore class of that year.

XIV.

POLITICAL ECONOMY AND INTERNATIONAL LAW.

Instruction in these branches is given by the President. He meets the Seniors, who elect Political Economy, twice a week during the first semester, and those, who elect International Law, twice a week during the second semester. Last year 48 Seniors pursued Political Economy. The statements of the main principles of the science were dictated to the class and taken down by them. A free oral exposition of each point was given after the dictation, with copious illustrations and with references to authorities. Special prominence was given to the questions of labor and capital, and of banking and currency. At each meeting the class was questioned upon the topics presented at the previous lecture.

Forty-six Seniors took the course in International Law. The general method of instruction was the same as that employed in Political Economy. The aim here was after tracing the growth of the laws which govern modern nations in their relations to each other, to expound and criticise the most important of those laws, and to illustrate them as far as practicable from the rich history of our own diplomatic intercourse with the world.

It is found that the classes are readily interested in these studies, though of course in the time devoted to them little more can be done than to familiarize them with a few important principles, kindle in their minds a taste for more extended study, and show them the proper method of investigation.

NOTE.—Owing to the absence of Professor Watson from the country, no Report of the instruction in Astronomy and of the year's work at the Observatory is furnished by him.

APPENDIX B.

REPORT OF FINANCE COMMITTEE.

The Finance Committee submit the following statement of the receipts and disbursements of the University for the year ending June 30, 1874:

RECEIPTS AS PER REPORT OF THE TREASURER.

Balance in the Treasury July 1, 1873:

To the credit of the General Fund	$17,051 71	
" " " Building Fund	3,059 94	
" " " Reserve Fund	2,182 67	
		$22,294 32
Received on account of State Aid		23,250 00
" " University Interest		38,014 00
" for Students' Fees		20,210 00
" for Int. on Treasurer's account		137 79
" Avails of Loans negotiated in anticipation of receipts from State		24,423 16
" from State balance of appropriation for new Hall, Act of 1873		5,300 00
" Interest on Reserve Fund		1,379 92
" from sales of bonds in Res. Fund		10,200 00
Total Receipts		$145,209 19

DISBURSEMENTS.

For account of General Fund	$125,157 41	
" " Building Fund	15,228 25	
" " Reserve Fund	412 88	
		$140,798 54
Bal. in Treasury July 1, 1874		$4,410 65

The receipts and disbursements on account of the General Fund have been as follows:

Balance in Treasury July 1, 1873, as per Treasurer's report	$17,051 71
Received of State Treasurer on account of University Interest Fund	38,014 00
Received from State Treasurer for account of State Aid	23,250 00
Interest on Treasurer's Account	137 79
Proceeds of Loans	24,423 16
For Students' Fees	20,210 00
	$123,086 66

DISBURSEMENTS.

For Salaries and Janitors' Wages for last quarter of previous year, and entire fiscal year, ending June 30, 1874	92,719 37
Paid on account of Loans and Interest	11,716 64
Treasurer's Expenses on same account	17 10
All other expenses of the University	20,704 30
	$125,157 41

Deficit in General Fund......... $2,070 75

Receipts and disbursements for account of Building Fund:

RECEIPTS.

Balance in Treasury July 1, 1873	$3,059 94
Received of State Treasurer balance of appropriation, Act of 1873	5,300 00
	8,359 94
Paid Warrants and Interest	15,228 25
Deficit	$6,868 31

Receipts and disbursements from the Reserve Fund have been as follows:

RECEIPTS.

Balance on hand July 1, 1873	$2,182 67
Received for Interest on Bonds	1,379 92
Avails of Bonds sold	10,200 00
	$13,762 59

DISBURSEMENTS.

Paid Warrants and Interest	$402 88	
" Safe Deposit Company	10 00	412 88
Balance		13,349 71
General Fund Deficit	2,070 75	
Building Fund Deficit	6,868 31	8,939 06
Balance in Treasury as per report of Treasurer		$ 4,410 65
Balance of unpaid Loans, July 1, 1874		13,000 00
Deficit for the year		8,589 35
The Reserve Fund now amounts to		$9,000 00

Invested in:

East Saginaw 10s	6,500 00
Manchester 10s	1,500 00
Midland 10s	1,000 00
	9,000 00

The total amount appropriated for Contingent Expenses for the year, was .. $21,104 40 for the following purposes:

For Regents' Expenses	443 45
" Postage	300 00
" Department of Physics	653 03
" Annual Calendar	1,200 00
" Grounds	400 00
" Fuel and Light	6,100 00
" Diplomas	229 90
" Furniture, new Hall	739 37
" Medical and Law Announcements	41 50
" Repairs and Alterations	1,500 00
" Insurance	2,100 00
" Legal Services	150 00
" Apparatus for Geological Dep't	275 00
" Engineering Department	22 05
" Hospital	450 00
" General Library	1,200 00
" Medical "	400 00

For Law "	400 00	
" Steward's Conting. Exp. Acc't...	4,500 00	21,104 30

Which was all expended except	$41 40

in the hands of the Steward.

The vouchers for the above disbursements have been examined by Regent Grant, and found correct.

The receipts and disbursements for the year ending June 30, 1875, are estimated as follows:

RECEIPTS.

Balance in Treasury July 1, 1874	$ 4,410 65
From University Interest Fund	38,000 00
" Annual State Aid, Act of 1873	31,500 00
" Students' Fees	25,000 00
	$98,910 65

DISBURSEMENTS.

To pay borrowed money	$13,000 00	
Salaries	78,960 00	
Catalogue	1,200 00	
Insurance	2,000 00	
Repairs	1,500 00	
Fuel and Lights	5,000 00	
Libraries	2,500 00	
Improvement of Grounds	400 00	
Postage	300 00	
Hospital	500 00	
Steward's Conting. Exp. Acc't	4,000 00	$109,360 00
Deficit		$10,449 35
Add to this the amount drawn from the Reserve Fund...		13,349 71
And the actual deficit is		$23,799 06

This deficit comes mainly from an excess of expenditure for contingent expenses over estimate of about...	$6,000 00
Payments on account of the University Hall	7,000 00
Deficit of State Aid below estimate	8,250 00

To aid in the enlargement of the Laboratory, the Board has issued $7,000 of interest-bearing time warrants, and $5,000 of the same kind of warrants, to provide much needed material in various departments of the University, and purchase books for the Law Library.

These warrants it is expected the University will be able to meet from the increased State Aid expected from the apportionment of A. D. 1875.

The only matter connected with the financial condition of the University that need occasion anxiety, is the certain deficit of about $10,000, that the Board will be called upon to meet at the expiration of the current fiscal year. Your Committee have no suggestions to make in regard to it, for the reason that we have no resources at our command, except an immediate reduction of salaries to the amount of 15 per cent., and that we are not prepared to recommend. If the increased State Aid meets our expectations, the difficulty will be overcome in three years, by the exercise of rigid economy in expenditure.

THOS. D. GILBERT,
C. B. GRANT,
ANDREW CLIMIE.

UNIVERSITY OF MICHIGAN.

THE
PRESIDENT'S REPORT

TO THE

BOARD OF REGENTS

FOR THE YEAR

ENDING JUNE 30, 1875.

ANN ARBOR:
PUBLISHED BY THE UNIVERSITY
1875

PRESIDENT'S ANNUAL REPORT.

To the Honorable Board of Regents:

I have the honor to present to you my Report for the year ending June 30, 1875.

THE FACULTIES.

At the October meeting of the Board, Moses Coit Tyler, M. A., was elected Professor of the English Language and Literature, and Charles N. Jones, M. A., Instructor in Mathematics.

At the special meeting of the Board in March, 1875, the resignation of Dr. E. W. Hilgard, Professor of Mineralogy, Geology, Zoölogy and Botany, dated March 8th, was accepted, and John E. Church, M. E., was appointed to complete the instruction for the year in Geology. The resignation of Frederic H. Gerrish, M.D., Professor of Therapeutics, Materia Medica and Physiology, was accepted.

At the special meeting in May, Alfred Hennequin, M. A., Instructor in French, was appointed Instructor in German and French, and was allowed leave of absence for a year.

At the June meeting Samuel A. Jones, M.D., was appointed Professor of Materia Medica and Therapeutics, and John C. Morgan, M.D., Professor of Theory and Practice, in the Homeopathic Medical College. Jonathan Taft, D.D.S., was appointed Professor of The Principles and Practice of Operative Dentistry in the Dental College. The resignation of George B. Merriman, M.A., Adjunct Professor of Physics, was accepted. The resignation of Dr. A. Sager, Dean of the Medical Faculty, was accepted. Prof. C. I. Walker, of the Law Department, was granted leave of absence for another year, and William P. Wells, M.A., was appointed Lecturer again in his stead. Frank J. Blackburn, M.A., and Henry F. Burton, M.A., Instructors in Latin, resigned their posts, and Elisha Jones, M.A., was appointed Acting Assistant Professor of Latin, to serve during the absence of Prof.

Walter. Prof. Frothingham's duties were somewhat modified and his title was changed to that of Professor of Practical Anatomy and Ophthalmic and Aural Surgery. William H. Pettee, M.A., was elected Professor of Mining Engineering, and Dr. Douglas, being transferred from his chair of Chemistry, was appointed Professor of Metallurgy, Chemical Technology and Director of the Chemical Laboratory. Will J. Herdman, M.D., was appointed Demonstrator of Anatomy. Frank Austin Scott, M.A., Instructor in German, resigned his place.

A committee charged with power to act have appointed John A. Watling, D.D.S., Professor of Clinical and Mechanical Dentistry, and Dr. W. H. Jackson, Demonstrator of Dentistry.

The establishment of the Homeopathic Medical College, the Dental School, and the School of Mines adds seven Professional chairs. One of these, the chair of Architecture and Design, was not filled at the June meeting.

THE NUMBER OF STUDENTS.

Department of Literature, Science, and the Arts.

Resident Graduates	10
Seniors,	100
Juniors,	79
Sophomores,	84
Freshmen,	110
In Selected Studies,	24
In Pharmacy,	68
In Analytical Chemistry (not enumerated elsewhere),	3
	478

Department of Medicine and Surgery.

Students—Total in the Department,	370

Department of Law.

Seniors,	141	
Juniors,	204	
Total in the Department,		345
Total in the University,		1193

Compared with the previous year, this report shows a decrease of 13 in the Literary Department, an increase of 56 in the Medical Department, and an increase of 25 in the Law Department, a total increase of 77.

The number of women in the University was 122, distributed as follows: in the Medical Department 47; in the Law School, 3; in the School of Pharmacy 4; in the Department of Literature, Science and the Arts 58. These last were classified thus: Resident Graduates 2; Seniors 9; Juniors 11; Sophomores 16; Freshmen 18; Select Studies, 8.

As usual we draw our students from a wide area. Thirty-three States and Territories and Ontario (Canada), the Hawaiian Islands, Japan, Natal (South Africa), Liberia and Russia have furnished us students this last year. Michigan sends about the same relative proportion every year.

DEGREES.

Degrees were conferred as follows:

Pharmaceutical Chemist,	**18**
Civil Engineer,	**20**
Bachelor of Science,	**18**
Bachelor of Philosophy,	**21**
Bachelor of Arts,	**42**
Doctor of Medicine,	**79**
Bachelor of Law,	**136**
Master of Science (in course),	**4**
Master of Science (on examination),	**1**
Master of Arts (in course),	**27**
Master of Arts (on examination),	**2**
Master of Philosophy (in course),	**2**
Total,	**370**

The honorary degree of Doctor of Philosophy was conferred on one person, and the honorary degree of Doctor of Laws on another.

The graduating class in the Literary Department numbered 101, and was the largest class which has graduated at the University.

The decision of the Board to confer no Master's degrees after 1877 except on examination is warmly approved by the judicious friends of good learning, and we have many indications that it will act as a wholesome stimulus to our graduates to pursue post-graduate studies. Candidates are already working for the higher degree of Doctor of Philosophy.

THE UNIVERSITY AND THE PUBLIC SCHOOLS.

I take pleasure in recognizing anew the indebtedness of the University to our public schools. This Institution rests upon them as its foundation. While they maintain their excellence, and the interest of our citizens in them continues abated, nothing but the saddest mismanagement can seriously disturb the prosperity and usefulness of this Institution. The University is constantly repaying its debt to the schools by sending to them thoroughly trained teachers, who carry the inspiration of a generous culture to their work. Thus every year the schools and the University are becoming more closely identified with each other so that no other State in the Union, I think, has an educational system so nearly approaching to organic completeness and unity as Michigan. The poorest child in the humblest cabin of our northern woods may pass from the log school-house through every grade of instruction, to the attainment of a collegiate and a professional education, almost without charge.

The policy of receiving students from approved schools without examination still continues to produce satisfactory results. More than one half of our Freshman class is annually furnished by these schools, and their average preparation is found to be better than that of the rest of the class. Students were received on diploma last year as follows: from Detroit, 8; Jackson, 1; Coldwater, 4; Pontiac, 6; Flint, 4; Adrian, 1; Grand Rapids, 3; Ann Arbor, 42; total, 70. It is proper to say that the size of the class from Ann Arbor is due largely to the attendance of non-resident pupils, who are attracted by the proximity of the school to the University. I think that only two preparatory schools in the United States now send as large classes to college as the High School of Ann Arbor.

The aim of our Faculty is to coöperate with the School Boards and teachers in adapting the courses of the schools and of the University to each other. This has in the main been accomplished in such a manner as to lead to the continual elevation of the standard of work in the schools, and so of the standard of admission to the University. It is believed that this has been as profitable to the schools as to the University.* Criticisms of

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* In order to show how the subject appears from the teacher's point of view, the following extract is given from a paper read to the State Teachers' Association by Mr. J. C. Jones, Superintendent of the Pontiac schools. Speaking of our plan, he says:

"' Our own opinion, after an experience of two years in such relation, may be summed up as follows:

"1st. It has intensified, deepened and dignified the work of the high school. This may seem an indefinite statement, for it is a matter better felt than expressed. Pupils take a greater pride in getting good lessons, which they prepare far easier and much better.

"2d. The visits of the University committee are looked forward to and labored forward to with excellent spirit and interest, which leads to much conversation about the University and its requirements, determining many more on a college course than under the old system. This increased amount of talk is one of the greatest benefits to the school, for it brings the University within the pupil's vision and constantly augments his desire to enter its walls.

"' Since putting on paper my own experience, I have received a letter from Prof. Charles Chandler, instructor in Latin in Dennison University, Ohio, long time pupil of the Pontiac high school, and teacher of languages in the same, before and since the school has sustained this relation to the University, giving his opinions, from which I quote the following:

"'In case of those intending to go to the University, the advantages of the diploma system are marked and undeniable. Such students do better work, and more of it, and in a better spirit, than was formerly the case. It seems easier for preparatory students to get a clear idea that before they get into the University there is just so much work to be done, and that there is no use trying to dodge it, or to do it in any other way, than by steady work.' In speaking of the increased talk about the University and its wants, he says: 'I consider this greatly increased amount of talk and thought about college, to be almost the most powerful cause operating to produce greater interest in study and better work. By so often thinking of the University course, they are better able to look upon their high school course, in its proper perspective as part of an extended one; so they are more contented to devote themselves to proper high school work, not being led away by wild desires for showy studies and general smattering.'

"3d. Parents manifest more interest and greater pride in the school and its success. They get into closer sympathy with the school, come to understand the character of the work it is doing, and become much more earnest supporters of it.

"4th. It increases the number preparing for college. In 1872, in the Pontiac high school, the number in Latin, having a college course in view, were nine; in 1873, thirteen; while we were not a little surprised, this fall (1874), to find the number had increased to thirty; and this, when the classes entering the high school were about the same in number each year—the largest class being that of 1872.

"5th. Then this method makes it better for the pupil physically as well as mentally. Having labored long and successfully, he becomes possessed of a certificate, which ends the worry and cram of the long vacation just previous to entering college. For all this he has been willing to do good work, not by times, but constantly, through his whole course, which is an immeasurable advantage, begetting in him good habits of study.

"6th. It tends to abolish partial courses and to throw pupils into regular ones, arousing the spirit of emulation among classes for the good of all. This class spirit exerts a wonderful power over its less resolute members, inducing them to continue their labors, which usually results in a genuine love of study possessing them.

"7th. It reduces the possibility of partially prepared pupils of such schools from slipping into college without a pretty thorough examination. And this is as it should be, for it is not only an injury to the school that such pupils be admitted to college, but is an insult to the faithful ones who have fulfilled the requirements by hard study before entering.

"8th. This may be given in Mr. Chandler's words: 'I am convinced that with the present requirements for admission, a boy can be got into the University in most cases creditably, with at most two-thirds of the work he must do to get a diploma and certificate, and that so the average diploma student this relation of the University to the High Schools have come chiefly from those, who are not familiar with the actual workings of our system.* We believe that we are just now about to succeed in making more complete than it has been the mutual adjustment of our work and that of schools, which can prepare students only for our scientific courses. It is not practicable for all the schools, which can give English courses, to keep up a classical department. Some schools have in the attempt to teach the classics to one or two pupils unduly increased their expenses. With the present distribution of population in Michigan it is enough that one or at most two High Schools in any one even of the more populous counties undertake the work of classical preparation for the University. Such schools having their income enlarged by fees from non-resident students can better afford to secure competent classical teachers. There is, however, no respectable High School in the State, which cannot do preparatory work, that the University with perhaps some unessential modifi-

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will do half as much again work in passing over the same ground, as he would do under the old system.'

"9th. One of its best effects is upon the teacher. This is, perhaps, its very best. Considering, as they do, that their reputation rests upon well prepared pupils, they are induced to acquaint themselves with the best methods of instruction, to post themselves thoroughly, to study clearness of illustration, to present only the necessary facts and points, and to keep these constantly before the minds of their pupils. There comes of this, close, accurate scholarship.

"In conclusion, nothing has awakened a deeper sympathy among the people for the University and its prosperity, than this reciprocal relation of the high schools and the University, and it would be a sad blow to higher education in this State to sever it."

Prof. Jones also quotes from Prof. Strong, Superintendent of Schools at Grand Rapids, as follows:

"The present attitude of the University toward the high schools of this State, has stimulated every department of those schools, and infused new life and vigor into every class. This seems to me the freshest and healthiest stimulus which they have received since the establishment of graded schools in this State."

* President Eliot of Harvard College seems to have expressed an opinion without being fully acquainted with the facts. In his last Annual Report he says, after briefly describing our system of receiving students on diploma, "that the University should have been willing to try so unpromising an experiment proves that the lack of connection between the secondary and the higher instruction in Michigan must have been painfully felt." It is singular that it should not have occurred to President Eliot that the University could have ventured on the experiment only because fortunately the connection between the secondary and the higher instruction in Michigan is probably closer than in any other State, and so the experiment was thought to give a promise of good results, which has in fact been fulfilled.

cation of its present requirements, can properly accept as suitable for its scientific courses.

THE YEAR'S WORK.

The work accomplished by the Faculties and the students during the year has been eminently satisfactory. A spirit of earnestness and order has prevailed among the students of all the Departments. It is one of the conditions of work like ours that the petty mischief of some reckless student or a triumph in some athletic game will be paraded through the newspapers with more noise than the results of twelve months' manly and undemonstrative study of twelve hundred students. But those, who rightly estimate college work will not undervalue the intellectual toil, which conscientiously performed, has proceeded in quietness and peace.

There has been during the past year no important change in our methods or courses. The freedom in the choice of studies, which is given to the Senior class, still yields happy results. It may be hoped that at no distant day it may be extended to the Juniors in regard to certain studies.

In the Medical Department an important step was taken at the beginning of the year. An examination for admission was held. Though the requirements were very slight, it was found necessary to reject some of the applicants, whose ignorance was profound. That ignorance did not prevent them obtaining ready admission to other schools. A more rigorous examination was determined on for the year 1875. I believe that no other Medical School in the Union yet holds an examination for admission.* I am sure that we have taken a step in the right direction. We must proceed in raising the standard for admission just as rapidly as we can without peril to the School. Happily there seems to be throughout the country and in the medical profession itself a new interest in the subject of medical education. On no educational subject is an awakening of interest more needed. The present state of education in the profession is as disgraceful to the practitioners as it is dangerous to the patients. The Board of Regents have placed on record their purpose to do all they properly can to improve the standard of medical education. It is next to impossible for us to advance as rapidly as we desire, unless the profession will stand by us in our efforts and other medical schools will also show some courage in coöperating with us. We appreciate the fact that schools, whose professors are dependent for their remuneration on the fees from students, can not afford to disregard numbers. Unhappily we have not income enough to enable us to be entirely indifferent to the attendance. But there are cheering signs that a large number of physicians will sustain us in our attempt to secure better preparation of the students for their work here, and more extended and improved courses of instruction. The erection of the new Hospital will materially enlarge our facilities for clinical instruction.

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* Harvard Medical School will require an examination in 1877 and thereafter. Dartmouth and Bowdoin have also decided to hold preliminary examinations.

The Law School has enjoyed marked prosperity during the year. When we consider how many Law Schools have been established in recent years in the West, it is very gratifying that the attendance on our School is undiminished. The appropriation made by the Regents for the increase of the Law Library has been judiciously expended, and has brought a very valuable and much needed addition of books to our shelves. But the Library room is altogether too strait for our needs. There seems to be no feasible way of securing proper accommodation for the Law Library, until we can have a new building for the General Library. The Law Library then can and must be removed to the first floor.

The School of Pharmacy is attaining a reputation and a patronage which should not be overlooked. Its growth is regular, steady and healthy. We have been constantly broadening the course of work, until now a very satisfactory significance attaches to the degree of Pharmaceutical Chemist from this University.

It is proper to say here that several of our Professors have during the year published works, which reflect honor on themselves and the University. Dr. Cocker's work on The Theistic Conception of the World has recently come from the press.

Prof. Adams's Democracy and Monarchy in France has passed to a second edition in this country, and a German edition has appeared at Stuttgard. Prof. Greene has published a work on Graphical Methods for the Analysis of Bridge Trusses, extended to Continuous Girders and Draw Spans, Prof. Prescott one on Proximate Organic Analysis and one on the Chemical Examination of Alcoholic Liquors, Prof. D'Ooge an edition of Demosthenes on the Crown, Prof. Ten Brook a History of American State Universities with a Particular Account of the Rise and Development of the University of Michigan, and Prof. Olney has added some new volumes to his series of mathematical works.

Prof. Watson went to China a year ago in charge of a party sent out by the United States Government to observe the transit of Venus. On his return home through Egypt he was employed for some time by the Khedive in important geodetic work.

THE LIBRARY.

It appears by the Librarian's report that the additions to the Library during the past year have been as follows: Volumes: by gift, 126; by purchase, 392; by binding of periodicals, 91; total, 609. Pamphlets: by gift, 124; by purchase, 20; total, 144.

I cannot but express again and with renewed emphasis my opinion of the utter inadequacy of the appropriations which the condition of our Treasury enables you to make for the increase of our Library. No Library of its size is so much used. It is open all day and until 9½ o'clock in the evening. It is not closed even in vacations. Yet frequently the spacious room does not furnish sittings enough for the readers. There is a constant and eager demand for the best works in every department of science and letters. The efficiency of all the oral instruction given by our various Faculties is largely dependent on the aid which can be furnished by the Library to the student. It is not at all extravagant to say that ten thousand dollars annually for several years could be usefully expended for the purchase of books which may be deemed indispensable. We are not at all able to provide ourselves with books, which are absolutely essential to our most urgent needs. Private munificence could not do us a better service than by placing at our disposal a permanent fund for the increase of the Library.

THE MUSEUM.

Our collections are constantly increasing. The additions of botanical specimens during the year have been, 4,402 entries, 11,766 specimens; of zoölogic l, 1,333 entries, 13,677 specimens; of geological and mineralogical, about 400 specimens; of archæological, 650 specimens.

The most valuable additions have continued to be those sent by Mr. Steere, who has won so wide a reputation as an indefatigable collector. The specimens he has sent from China and Formosa within the last twelve months are very interesting. I cannot but express the hope that we may be so fortunate as to secure his aid in arranging his collections in our Museum.

THE WILLIAMS PROFESSORSHIP.

So much progress has been made in the endowment of the Williams Professorship of Physics that we may confidently expect the whole sum required to be raised at an early day. The income of the fund is to be enjoyed by the venerable and beloved Professor, whose name it bears, so long as he lives, and after his death is to be applied to the support of the chair of Physics. Offerings were never prompted by sincerer affection than that which has led the pupils of Dr. Williams to brighten and cheer his declining years by this proof of their devotion to him. May it not only gladden but prolong his serene and beautiful life!

AID FROM THE STATE.

The Legislature at its last session treated us generously. They passed six appropriation bills for our aid, as follows:*

1. An act appropriating $5,000 to pay the expenses of bringing water to the grounds.

2. An act appropriating $13,000 to liquidate an indebtedness, which we had incurred.

3. An act appropriating $3,000 a year for two years for the establishment and support of a Dental School.

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* See Appendix A. for these Acts.

4. An act appropriating $8,000 a year for two years for instruction in a School of Mines, and $2,500 a year for two years for the purchase of apparatus.

5. An act appropriating $8,000 for a Hospital, on the condition that Ann Arbor should contribute $4,000.

6. An act appropriating $6,000 a year for the establishment and support of a Homeopathic Medical College.

An ample supply of water has been obtained from springs on the land of Mr. Emanuel Mann, a little more than a mile southwest of the University. It flows through wooden pipes 3,000 feet, to a cistern on State street, and is pumped from the cistern through iron pipes 2,000 feet, and forced into a tank in the tower adjacent to the Laboratory. The tank holds 49,000 gallons. The water is distributed by pipes to the various University buildings. The need of this additional supply of water had become very pressing. The rainfall on our roofs did not furnish water enough to supply our steam boilers, to say nothing of the wants of the Hospital, the Medical College, and the Laboratory. We had no means of contending with fire. The danger from fire is now so much diminished that we expect to secure a reduction in the cost of insurance equal to 12 per cent. of the cost of introducing the water.

The debt which the Legislature lifted from our shoulders was incurred partly by the purchase of apparatus for the illustration of scientific courses, and partly by the erection of an addition to the Laboratory. The apparatus was indispensable in improved methods of teaching. The enlargement of the Laboratory was rendered absolutely necessary by the fact that a hundred students more than the building could accommodate were waiting for tables. The alternative was to send these students away from our doors or to furnish the needed room and contrive as we best could to meet the expense. We believe that the State would not have wished us to dismiss the waiting students from our halls. We hoped at the time to be able to remove the debt before long, even if we should have no special help from the State. But we are none the less appreciative of the timely aid which in accordance with the suggestion of the Governor was furnished us by the Legislature.

The members of the Dental Profession in the State have for some time been desirous of securing the establishment of a Dental School here. The Regents and the Medical Faculty have repeatedly expressed to them an earnest wish to coöperate with them in attaining their end. The grant of the Legislature enables us to set a School in operation. There seems good reason to expect for it a successful future. Hardly any similar school in the country furnishes so thorough and extended instruction in those branches of medical science which are a part of the dentist's education, and only one other offers the general advantages of University life to its students. Then there is a large territory near us, which is unprovided with such a School. There is none in Illinois, Indiana, Wisconsin, Minnesota, or Iowa. If the School prospers, as we may reasonably trust it will, ampler means will be required for its support, and doubtless will be provided.

The establishment of the School of Mines was called for in the Legislature by members from the Upper Peninsula. Mining is so important an industry in that region that attention has naturally been turned to the importance of training young men for the profession of mining engineers. We had done what our facilities would permit in imparting such a technical education as a mining engineer should have, but we had long been extremely desirous to do more. A joint committee of the Senate and the House of Representatives visited the University, and reported in substance that we were already giving thorough instruction in many of the branches which were essential to the education of mining engineers, and that a School of Mines could be organized more economically and efficiently here than elsewhere. The act as finally passed provides for the appointment of a Professor of Mining Engineering, a Professor of Metallurgy, and a Professor of Architecture and Design, and assistants to these Professors, and for the purchase of apparatus, models, drawings, etc., of the value of $5,000. The Professorship of Architecture and Design has not yet been filled, but we hope to find soon a suitable person for the place. There is great need of such a chair. We do not expect a large number of students at first in this School, but we think it will have a steady and healthy development.

We have long felt the need of ampler Hospital accommodations both for the comfort of patients and for the advantages of clinical instruction in the Medical School. The legislative appropriation of $8,000 was available only when the city of Ann Arbor had paid $4,000 into the hands of our Treasurer. It is very gratifying to record the fact that the citizens with hardly a dissenting voice cheerfully and promptly raised the sum asked of them. Steps were taken at once to procure plans for the buildings. Unexpected delays of the architect made it impossible to begin the work as soon as we had intended, but it is hoped that we shall be able to occupy the Hospital at an early day. We are erecting two pavilions 114 feet long and 30 feet wide, containing 48 wards. The structures are built on the principles which according to the best authorities should govern the construction of hospitals.

The establishment of the Homeopathic Medical College, it is hoped, puts an end to a controversy which has been prolonged, unpleasant, and in some respects harmful to the University. It is not necessary to recite the history of the controversy. The Regents in the exercise of authority vested in them by the Constitution of the State have consistently and wisely declined to obey every law, which asked them to appoint Professors to teach the Homeopathic system of medicine in the Department of Medicine and Surgery, since from its establishment that Department had been under the charge of a Faculty, who believe that system to be false. But the law enacted last winter, providing for a Homeopathic College with a distinct and separate organization, and furnishing funds for its support, has met with a prompt recognition from the Board. Professors approved by the Michigan Homeopathic Medical Society and by the American Institute of Homeopathy, a National Association, were appointed to the chairs of Theory and Practice of Medicine and Materia Medica and Therapeutics, a commodious lecture room was provided, and all other needful arrangements were made for the accommodation of the School.

It may not be inappropriate briefly to indicate the plan of organization of this College, since misapprehensions prevail in some quarters. It is a college or school as independent and distinct in its organization from other schools or colleges in the University as the Law School is distinct from the Department of Literature, Science and the Arts. Its affairs are controlled exclusively by its own Faculty. Persons desiring to obtain a degree in this College are registered and matriculated by themselves. If they graduate, they receive the diploma of the Homeopathic Medical College. It is a general rule of the University that students in one School or Department may attend lectures in any other under such regulations as may be deemed wise. It is entirely in accordance with this usage that matriculants in the Homeopathic Medical College study Theory and Practice and Materia Medica in that College, and attend lectures on Anatomy, Surgery, Physiology and Obstetrics in the Department of Medicine and Surgery. In fact students, who were believers in the Homeopathic system of medicine, have always been found in our medical classes, as in the classes of most medical schools of reputation. The Professors in the old School at the end of their term examine all students who offer themselves for examination, and certify to the Regents the results. The Professors in the Homeopathic College pursue the same course with their students. The Regents award the degrees. Matriculants in the Department of Medicine and Surgery will receive the diploma of that School, if they have passed their examinations with sufficient credit; matriculants in the Homeopathic School will on the same conditions receive the diploma of that School.

It is believed that reasonable men of both schools of medicine will agree that this is a judicious method of carrying the law of the State into effect. So much feeling has been awakened by the discussions and collisions of the two Schools in all parts of the country, and especially in Michigan, that no possible plan for setting up a Homeopathic College here could escape criticism. But leading men of both Schools have expressed their acquiescence in the plan adopted. It is hoped that our organization of work will by its actual operation commend itself to the approbation of the public. I feel that praise is justly due to the Professors in the Department of Medicine and Surgery, who under the fire of criticism, sometimes harsh and ungracious, from certain of their professional brethren, have stood steadily at their posts at the risk of being misrepresented and even calumniated.

If no unexpected embarrassments arise from this interesting experiment in medical education—for such we must consider the attempt to have two different systems of medicine taught, even in separate colleges, in the same University—one obstacle to securing needed aid from the Legislature for the Institution is removed. Whenever help was asked, many friends of Homeopathy declined to favor any grants, unless Professors of the Homeopathic system of medicine were appointed. To others, who really cared nothing for Homeopathy, a convenient excuse was offered for opposing appropriations for the University. The argument and the excuse for refusing us assistance are now removed.

The aid which the Legislature gave us last winter must be regarded as of great importance, not only because it secures an immediate enlargement of the scope of our work, but because it seems to promise yet larger help in the future. In view of the recent legislation it does not appear extravagant to assume that the State is now fairly committed to the policy of concentrating here whatever schools for higher education it may hereafter set up, and of giving to the schools already established at this place an adequate support. Any school planted here enjoys collateral advantages which cannot be afforded elsewhere in the State, and every new school brings its quota of strength to the other schools and interests a new circle of friends in the whole Institution. We trust that we are not over-sanguine when we say that we now start upon a new era in the history and work of the University.

But it is prudent to guard against an error, into which those not familiar with our affairs may fall. It would be a mistake to suppose that the generous legislation of last winter increases by a penny our pecuniary resources for the work which we have heretofore been doing. Not a dollar of all the appropriations goes to enlarge the funds on which we depend for the current expenses of the Academic Department, the Medical Department or the Law Department, the Library or the Museum. On the contrary the increase in incidental expenses, for the present at least, may make some draft on our general fund. We are still in sore need of money for scientific apparatus and for books, and must soon have more buildings. It is only by the most careful vigilance over every dollar, only by refusing to our Professors means of illustration which seem well nigh indispensable, and by reducing our Library fund to a discreditable sum, that we are able to keep out of debt. If an Institution like this is really doing what it ought, its needs, its demands, must constantly increase. It was in wise recognition of this fact that the Legislature in 1873, set apart for the aid of the University a tax of one-twentieth of a mill on the ratable property of the State. It was expected that as the State should grow in wealth, the income of the University would be increased. But it appears that there is grave doubt whether the appraisals which the counties will report to the State Board of Equalization in 1876 will be larger than the revised appraisal which the Board made in 1871. In that case, the design of the legislators that the income of the University from the tax should be enlarged in 1876, will be thwarted, unless the State Board come to our relief by raising the appraisal, as their predecessors did in 1871. It is to be hoped that the Board in determining their action will not overlook this consideration. The Report of the Finance Committee of the Board of Regents, appended to this Report, will show our financial condition at the end of our fiscal year, June 30, 1875. It is certain that unless the one-twentieth of a mill tax yields us a larger sum after 1876 than it does at present, viz., $31,500, we shall be most seriously embarrassed. We shall be compelled not only to check the expansion of our work, we shall have to curtail our work or do it less efficiently. I do not believe that the State of Michigan wishes us to curtail our work. She feels a just pride in what the University has been able to accomplish. So long as we use wisely and economically the funds she en-trusts to our care, she will not cease to provide for our most pressing wants. We therefore do not hesitate to set forth those wants with the utmost frankness, and anew to commend the University with all its glorious possibilities to the good State which has done so much for it in the past.

APPENDIX A.

The following Acts were passed by the Legislature of Michigan at the session of 1875:

AN ACT to provide for a Supply of Water for the University of Michigan.

SECTION 1. *The People of the State of Michigan enact*, That for the purpose of supplying the University of Michigan with water, there shall be and is hereby appropriated out of any funds in the treasury of the State of Michigan not otherwise appropriated, the sum of five thousand dollars. Said moneys shall be expended under the direction of the Board of Regents of the said University, and shall be drawn from the treasury on the presentation of the proper voucher of the Treasurer of the said Board to the Auditor General, and on his warrant to the State Treasurer; and no money shall be drawn by virtue of this act by such Regents, unless they shall have first filed with the Auditor General an estimate and statement showing the purpose for which such money is required, and none shall be drawn further than is required to pay for labor done, and materials furnished.

Approved April 8, 1875.

AN ACT to provide for paying the outstanding interest-bearing Warrants of the University of Michigan.

SECTION 1. *The People of the State of Michigan enact*, That there shall be and is hereby appropriated out of any funds in the treasury of the State of Michigan not otherwise appropriated, the sum of thirteen thousand dollars, or so much thereof as may be necessary, for the purpose of paying the outstanding interest-bearing warrants on the treasury of the University of Michigan. Said money shall be drawn from the treasury on the presentation of said warrants accompanied by the proper voucher of the Treasurer of the Board of Regents of the University of Michigan to the Auditor General, and on his warrant to the State Treasurer.

SEC. 2. This act shall take immediate effect.

Approved April 23, 1875.

AN ACT to provide for an Appropriation to enable the Board of Regents to establish and maintain a Dental School in connection with the Medical Department of the State University.

SECTION 1. *The People of the State of Michigan enact*, That there shall be and is hereby appropriated out of any funds in the treasury of the State of Michigan, not otherwise appropriated, the sum of three thousand dollars for each of the years eighteen hundred and seventy-five and eighteen hundred and seventy-six, for the purpose of enabling the Board of Regents to establish and maintain a Dental School in connection with the Medical Department of the State University. The above mentioned sum shall be drawn from the treasury, on the presentation of the proper voucher of the Treasurer of said Board to the Auditor General, and on his warrant to the State Treasurer.

Approved May 1, 1875.

AN ACT to organize a School of Mines in the University of Michigan. the establishment of additional professorships, and making appropriations for maintenance of the same.

SECTION 1. *The People of the State of Michigan enact*, That the Board of Regents of the University of Michigan are hereby authorized to establish a School of Mines in connection with the polytechnic department of that institution, to be called the School of Mines of the University of Michigan.

SEC. 2. The Board of Regents are hereby authorized to establish and maintain in the University of Michigan at least three professorships: one of Mining Engineering, one of Metallurgy, and one of Architecture and Design, with the necessary assistant instructors.

SEC. 3. That for the professorships and assistant instructors mentioned in section two, and also for the general expenses of said School of Mines, and of the professorship of architecture and design, there shall be assessed upon the taxable property of the State for the year eighteen hundred and seventy-five, and also for the year eighteen hundred and seventy-six, the sum of eight thousand dollars for each of said years, which sum shall be paid to the treasurer of the Board of Regents of the University of Michigan, in two equal sums, on the first days of May and November of the year eighteen hundred and seventy-six, and of the year eighteen hundred and seventy-seven, upon a requisition of the treasurer of said Board of Regents, the requisition being accompanied by a certificate of the president and secretary of said board, stating that the amount so drawn, is to be applied to the purpose specified in this section.

SEC. 4. The Board of Regents shall commence the equipment of said school with the necessary engines, boilers, and machinery, serviceable models or furnaces, pumps, hoisting apparatus, and other mechanical mining appliances; serviceable models of shaft-work, mining structures, bridges, transportation cars, roads, appliances for crushing, stamping, washing, and reduction of rock and ores, the display of tools, implements, apparatus, drawings, maps, photographs, and specimens of minerals and metals and all else needful and necessary for imparting to students the highest theoretical and best practical instruction, according to the constant improvement from time to time made in the methods of mining and quarrying, and in architecture and design.

SEC. 5. That there be appropriated hereby from any money in the treasury of the State of Michigan not otherwise appropriated, the sum of two thousand five hundred dollars for the year eighteen hundred and seventy-five (1875), and two thousand five hundred dollars for the year eighteen hundred and seventy-six (1876), to be expended under the direction of the Board of Regents of the University of Michigan, for the purposes mentioned in section four of this act; and this sum so appropriated shall be placed by the Auditor General to the credit of the University of Michigan, designated as "special fund for the establishment of the School of Mines," and shall not be diverted to any other purpose.

SEC. 6. There is hereby appropriated for the specified purpose of carrying out the provisions of section four of this act, the sum of five thousand dollars; and the same shall be incorporated in the State tax as follows, to wit: for the year eighteen hundred and seventy-five (1875), two thousand five hundred dollars; for the year eighteen hundred and seventy-six (1876), two thousand five hundred dollars; which taxes, when and as collected, shall be credited up to the general fund of the State to reimburse the same for the amount drawn from it as provided for in section five.

SEC. 7. That the sum appropriated, as provided for in section five of this act, shall be paid to the treasurer of the Board of Regents of the University in any sum or sums he may require, upon his filing with the treasurer of the State of Michigan his voucher, accompanied by the certificate of the president and secretary of the Board of Regents of the University of Michigan, certifying that the sum so asked for is needed to liquidate obligations of the University then already incurred and due for the purposes specified in section five of this act.

SEC. 8. The Board of Regents shall yearly hereafter, in the annual report of the University, include a detailed statement of the expenditures out of the above appropriations for their respective objects.

SEC, 9. The president of the University shall be provided at all reasonable times, upon application, for the purposes of the School of Mines, with abstracts of all statistical tables and other information resulting from mining and quarrying, that shall come into the possession of the various State offices.

Approved May 8, 1875.

AN ACT making appropriations for the building of a hospital in connection with the University of Michigan, and for the equipment of the same with hospital stores and furniture.

SECTION 1. *The People of the State of Michigan enact*, That there shall be and is hereby appropriated out of any moneys in the treasury of the State of Michigan not otherwise appropriated, the sum of five thousand five hundred dollars, for the purpose of building a hospital in connection with the University of Michigan, which said money shall be expended under the direction of the Board of Regents of [the] said University, and shall be drawn from the treasury on the presentation of the proper voucher of the treasurer of said board to the Auditor General, and on his warrant to the State treasurer; and no money shall be drawn by virtue of this act by such Regents unless they shall have first filed with the Auditor General an estimate and statement showing the purpose for which said money is required; and none shall be drawn further than is required to build such hospital in payment for labor and material furnished.

SEC. 2. There shall be and is hereby appropriated out of any moneys in the treasury of Michigan not otherwise appropriated, the further sum of two thousand five hundred dollars, to be expended under the direction of the Board of Regents of said University for equipments, supplies, and such hospital stores as they shall deem necessary for the maintenance of such hospital, which said moneys shall be drawn from the treasury on the presentation of the proper vyucher of the treasurer of the said board to the Auditor Journal and on his warrant to the State treasurer; *Provided*, That no money shall be drawn from the State treasury under this act until the citizens of Ann Arbor shall have first contributed and deposited the sum of four thousand dollars with the treasurer of the said Board of Regents, which said moneys shall be disposed of as the other moneys appropriated in this act.

SEC. 3. This act shall take immediate effect.

Approved May 3, 1875.

AN ACT for the establishment of a Homeopathic Medical Department of the University of Michigan.

SECTION 1. *The People of the State of Michigan enact*, The Board of Regents of the University of Michigan are hereby authorized to establish a Homeopathic Medical College, as a branch or department of said University, which shall be located at the city of Ann Arbor.

SEC. 2. The treasurer of the State of Michigan shall, on the first day of January, eighteen hundred and seventy-six, pay out of the general fund, to the order of the treasurer of the Board of Regents, the sum of six thousand dollars, and the same amount on the first day of January of each year thereafter, which moneys shall be used by said Regents exclusively for the benefit of said department.

Approved April 27, 1875.

APPENDIX B.

REPORT OF THE FINANCE COMMITTEE.

To the Board of Regents of the University of Michigan:

The Finance Committee submit the following report of the receipts and disbursements of the University, for the fiscal year ending June 30, 1875:

RECEIPTS.

Bal. in treasury July 1, 1874	$ 4,410 65
Rec'd of State Treasurer on account of University Int. Fund	38,650 00
Rec'd of State Treasurer, 1-20th mill tax	31,500 00
" of State Treasurer (act of 1875) for payment of outstanding University warrants	13,000 00
Rec'd of Steward for students' fees	29,255 00
" for interest on Treasurer's account	98 14
" for principal and interest on bonds in reserve funds sold	10,657 27
Rec'd for temporary loans	29,868 11
	$157,439 17

DISBURSEMENTS.

Paid salaries and janitors' wages, as per schedule herewith submitted	78,117 00
Redemption of outstanding warrants	13,000 00
Accrued interest on same	693 11
Steward's disbursements, as per schedule and vouchers herewith submitted	28,438 35
Liquidation of loans and interest	34,896 60
Balance to new account	2,294 11
	$157,439 17

The estimated receipts for the year ending June 30, 1876, are as follows:

Balance in treasury July 1, 1875	$ 2,294 11
For University interest	38,500 00
Annual State aid, act of 1873	31,500 00
" " " " 1875	11,500 00
Students' fees and diplomas	27,000 00
Appropriation for School of Mines, due May 1, 1876	4,000 00
	$114,794 11

The disbursements for the same time are estimated as follows:

For salaries, including the professors in the new department, and janitors' wages	$ 88,970 00
Annual Calendar	1,500 00
Insurance	2,200 00
Repairs and alterations	1,500 00
Fuel and lights	5,000 00
Libraries	2,500 00
Improvement of grounds	4,000 00
Postage	400 00
Hospital	500 00
Steward's contingent expense account	4,000 00
New boiler at Laboratory	2,000 00
Required for water supply, above appropriation	1,500 00
Regents expenses	630 00
	$111,100 00
Estimated surplus	$ 3,694 11

There are yet outstanding warrants amounting to $3,500.

The annual report of the Treasurer, with a full list of all warrants paid, is herewith submitted. This list of warrants has been compared with the books of the Secretary of the Board of Regents and found correct.

Your committee submits herewith a list of all the officers, professors and employes of the University, with the amount of salary paid to each.

It now seems as though there would not be a repetition of the extraordinary expenses that during the past three years have pressed so heavily upon the scanty resources of the University. The new buildings are complete and paid for, or will be before the close of another financial year. The water-works, for which an insufficient appropriation was made by the legislature, are in successful operation, and a supply of pure water will soon be distributed to all the buildings on the campus. Hydrants will be placed near the principal buildings, affording a fair protection against fire; and your committee think that a very material reduction in the cost of insurance will be effected by reason of the abundant supply of water and the appliances for making it available. The thorough manner in which the work has been and is being done, has increased the cost $1,500 above the amount originally estimated, and which the legislature was asked to appropriate.

It will be observed that the estimated disbursements for the current year are uncomfortably close to the receipts, but your committee thinks the estimate of expenses ought not to be exceeded, and need not be if the estimates are closely followed.

If the legislature at its next session shall, as is confidently expected, increase the annual aid to the University from $31,500 to $50,000, it will afford some means much needed to increase the libraries, and the facilities for instruction in many of the departments. The friends of the University (and they are very numerous in the State) will doubtless see to it that sufficient means are placed at the disposal of the Regents to maintain a steady growth in all the departments of the University, and to enable it to afford to the young men and women of the State every desirable facility for obtaining a thorough education.

THOMAS D. GILBERT,
C. B. GRANT,
ANDREW CLIMIE,
Finance Committee.

UNIVERSITY OF MICHIGAN.

THE
PRESIDENT'S REPORT
TO THE
BOARD OF REGENTS
FOR
THE YEAR ENDING JUNE 30, 1876

ANN ARBOR:
PUBLISHED BY THE UNIVERSITY.
1876.

REGISTER STEAM PRINTING HOUSE.

PRESIDENT'S ANNUAL REPORT.

To the Honorable Board of Regents:

I offer you my Report for the University year which ended June 30, 1876.

The changes in our Faculties have been as follows:

John W. Langley, B. S., was in August, 1875, appointed by the Executive Committee, Acting Professor of General Chemistry and Physics, and in June, 1876, was promoted by the Board of Regents to the full Professorship. In March, 1876, J. B. Steere, Ph. D., was elected Assistant Professor of Paleontology. Preston B. Rose, M. A., M. D., Instructor in the Chemical Laboratory, was in October, 1875, made Assistant Professor of Physiological Chemistry, was suspended in December, restored to his work in March, 1876, and was dismissed from his office in June last. In June, 1876, H. B. Hutchins, Ph. B., Assistant Professor of History and Rhetoric, resigned his chair and Isaac N. Demmon, M. A., was chosen to succeed him. In August, 1875, John J. Mapel, M. A., was appointed Instructor in German and French for one year, during the absence of Instructor Hennequin in Europe. Samuel T. Douglas, Ph. B., Ph. C., was in June, 1875, appointed Assistant in the Chemical Laboratory. In August, 1875, Abram V. E. Young, Ph. B., Ph. C., was appointed Assistant in Chemistry and Physics. In December, 1875, V. C. Vaughan, M. S., and Kate Crane, Ph. C., were appointed Assistants (for temporary service) in the Chemical Laboratory. In June, 1876, Mr. Vaughan received a permanent appointment to the same post which he had occupied temporarily. In June, 1876, M. W. Harrington, M. A., Assistant Professor in charge of Zoölogy and Botany, received permission to be absent in Europe for two years, and Volney M. Spalding, M. A., was appointed Instructor in those branches.

The continued illness of Dr. Henry S. Cheever constrained him to resign in April last, the chair of Physiology and Materia Medica, which he had so ably filled for several years. Prof. Frothingham is henceforth to give the instruction in Materia Medica, and the title of his Professorship has accordingly been modified.

W. L. B. Jenney, C. E., was, in March last, appointed to the chair of Architecture and Design.

In July the Executive Committee, who at the June meeting of the Board were charged with the duty of appointing two Lecturers in the Homœopathic Medical College for one year, selected F. A. Rockwith, M. D., as Lecturer on Obstetrical Therapeutics, and J. C. Gilchrist as Lecturer on Surgical Therapeutics.

The same Committee have also selected Prof. Burt C. Wilder, M. D., as Lecturer on Physiology for one course in the Department of Medicine and Surgery.

The instruction in Mineralogy and Geology has been given during the year by Prof. Pettee.

The whole number of persons on our Faculty roll was fifty-three. Three were not on duty here.

The total number of students in the University last year was 1,127, distributed as follows:

Department of Literature, Science, and the Arts.

RESIDENT GRADUATES	15
SENIORS	60
JUNIORS	73
SOPHOMORES	87
FRESHMEN	119
IN SELECTED STUDIES	19
IN PHARMACY	79
Total	457

THE POLYTECHNIC SCHOOL contains—

From the above Department	149
From the Department of Medicine and Surgery	2
Total	151

Department of Law.

SENIORS	157	
JUNIORS	164	
	——	321

Department of Medicine and Surgery.

STUDENTS—Total	312

Dental College.

STUDENTS—Total	20

Homœopathic Medical College.

STUDENTS—Total	24
	——
	1,129
Deduct names twice counted	2
	——
Total in the University	1,127

Just one-half of all the students this year were from Michigan, which is a larger proportion than usual. Thirty-four of our States and Territories, and Ontario (Canada) and Japan, have furnished us students. Illinois sent us 98, Ohio 85, New York 75, Pennsylvania 47, Indiana 46, Wisconsin 36, Iowa 20, Minnesota 20, Missouri 15. Kentucky 10, California 10. From New England, every State being represented, we had 14. From the Middle States, New York, Pennsylvania, New Jersey, Delaware, we had 129. Seven of the Southern States were represented in the classes. When we consider the financial embarrassments of our people, and remember how professional schools have been multiplying, the attendance upon the University must be considered satisfactory.

The number of women in attendance during the past year is 101, distributed as follows: in the Department of Medicine and Surgery, 37; in the Law Department, 2; in the Homœopathic Medical College, 2; in the Department of Literature, Science, and the Arts, 60. Of these last there were in the Senior Class 11; in the Junior Class 11; in the Sophomore Class 15; in the Freshman Class 16; in Select studies 3; in Pharmacy 3. The experience of this last year confirms the opinion we have been led to form by the experience of previous years, that women who come here in good health are able to complete our collegiate or professional courses of study without detriment to their health. It is worthy of note that the number of women in the University has varied very little during the last three years. This fact may indicate that we are not to expect at present any further rapid increase in the proportion of women to men in the University. The great majority of women will for the present probably seek at least their collegiate education in schools and colleges established for their sex alone. But we may well believe that the opening of this University and of other colleges to students of both sexes, has furnished a healthful and powerful stimulus to those Institutions to improve the quality and widen the range of their work.

The following is the number of degrees conferred:

Pharmaceutical Chemist	31
Civil Engineer	11
Bachelor of Science	14
Bachelor of Philosophy	13
Bachelor of Arts	38
Master of Science (on examination)	1
Doctor of Philosophy (on examination)	2
Master of Arts (in course)	31
Master of Science (in course)	7
Master of Philosophy (in course)	6
Doctor of Medicine	93
Bachelor of Laws	159
Doctor of Dental Surgery	4
Total	410

The degree of Doctor of Philosophy was for the first time conferred on examination. This degree, which is bestowed only on candidates, who have pursued extended post-graduate courses, and sustained most rigorous examinations is sought by some of our most aspiring and energetic graduates. After this year degrees in course will not be given. Every degree bestowed will then have a real significance.

The plan of receiving students from certain approved High Schools on diploma and without examination by us has worked so satisfactorily that the Faculty have deemed it prudent and wise to offer to receive students on diploma from a class of High Schools whose graduates have heretofore been admitted by us only on examination. We have, until this year, declined to approve any school which was not so organized and equipped as to be able to prepare students simultaneously for all our undergraduate courses of study. But we now propose to approve any good High School, which can show that it is thoroughly preparing students for any one of our classes. It seems better that a school should be encouraged to train students well in one or two courses than by undertaking more than it can do successfully to fail in doing any of its work well. And there seems no reason why a school which can prepare its pupils satisfactorily for our Scientific and Engineering courses alone should not be recognized by us as competent to do that particular work. It is thought that this modification of our plan will be helpful to many schools, acceptable to the public, and not injurious to the University.

We received last year on diploma: From Ann Arbor, 44; Detroit, 3; Coldwater, 1; Pontiac, 3; Flint, 1; Battle Creek, 2; State Normal School, 1; Fenton, 4; total, 59.

I think I have not known since my connection with the University so satisfactory a year's work in the undergraduate department. There has been hardly an occasion for the slightest disciplinary action. The students as a body have addressed themselves to their duties with marked assiduity. Another year's experience confirms the impression indicated in my last report that the liberty in the choice of studies in the Senior year now left to the students has greatly increased the value and amount of work accomplished in that year. To a limited extent elections of studies have been opened in the Junior and Sophomore years. We are constantly making progress in the application of laboratory methods of instruction in botany and biology. Admirable work has been accomplished in these studies. It is hard to be patient under the delay to which the scantiness of our means forces us, in equipping our physical laboratory. If physics are to be adequately taught to advanced students, it they are to be taught as chemistry, botany and biology are now taught, we must furnish ourselves with apparatus for our physical laboratory. We are in danger of falling behind most of the better institutions of the country in this regard.

Prof. Watson returned from his journey to China in time to resume his labors at the beginning of the academic year. Within the past twelve months he has discovered three more asteroids, making twenty in all, which are credited to him. It is much to be regretted that an Observatory, at which so much work is done, giving a wide reputation to the University and making most valuable contributions to science, is not provided with an adequate fund for the payment of assistants and computers, and for the publication of full reports of the labor accomplished.

The chair of Geology has now been vacant for a year and a half. Most of the instruction properly falling to that chair was given last year and is to be given this year by Prof Pettee. You are aware that our delay in filling the chair has been mainly due to economical considerations. It is at considerable inconvenience that Prof. Pettee rescues time this year from his work of Mining Engineering to discharge his present duties. The claims of his own department will be so pressing after this year that some other provision must be made for the instruction in Geology. I hope the condition of our treasury will permit us to call some suitable person to the Professorship.

We had last year three new schools to organize, the School of Mines, the Dental School, and the Homœopathic Medical School. The means placed at our disposal for the purchase of apparatus for the School of Mines enabled us to provide ourselves with a fair equipment, comprising furnaces, stamp mill, crusher, ores, furnace products, etc. Although the announcement of the organization of the school could not be made until just before the opening of the academic year, fifteen students were registered on its roll. It is evident that there is a real want for the training which this school aims to give.

It is with peculiar pleasure that I announce the generous purpose of the Directors of the Calumet and Hecla Mining Company to present to the School of Mines a beautiful model of their stamp mill, after the close of the Centennial Exhibition at Philadelphia. It has there attracted much attention. The cost of this model is, I am told, at least twelve thousand dollars. This gift is, therefore. larger than any before made to the University by any individual or private corporation. Mr. Alexander Agassiz, President of the Company, in a letter dated Sept. 1st, made known the intention of the company to favor us with this most valuable addition to our means of illustrating the instruction in mining. We cherish the gift not only for its intrinsic value, but also because it evinces on the part of those actively engaged in the mining industry of our State a most lively and helpful interest in our enterprise.

I beg leave to direct your attention to a report herewith submitted, from the Profsssor of Mining Engineering, concerning the School of Mines, its work, expenditures and needs. It will be seen from his detailed statement that a good beginning has been made towards the outfit of the School. The funds appropriated have, I think, been carefully and judiciously expended. A reverberatory furnace, a blast furnace and books are among the pressing wants, for which appropriations are desired. Prof. Pettee's suggestions concerning a summer trip of the students to the mining regions of the Upper Peninsula for special study there and the inquiry as to what shall be the requisites for the degrees of Civil Engineer and Mining Engineer are commended to your consideration. Of the great prospective usefulness of this School, if the Legislature shall provide for its continuance. there is no longer room to doubt. For the deep interest which our friends in the Upper Peninsula have taken in it, and for the valuable assistance they have rendered us, we are very thankful.

The act, which establishes the School of Mines, provides for a chair of Architecture and Design. We were unable to fill the chair in time to begin instruction last year. But Mr. W. L. B. Jenney, of Chicago, having accepted the Professorship last spring, preparations were at once commenced for the work of the new academic year. Orders were given for books, models, casts, and other necessary materials for illustrations in teaching. Prof. Jenney also gave two introductory lectures on Architecture. We have not looked for a large number of students the first year, but there can be no doubt that there will be a considerable demand[*] for instruction in this department. Certainly there can be no doubt that there is a great need of thoroughly trained architects, who can bring to their work refined and educated taste and scientific knowledge.

The Dental School opened with an attendance, which in the circumstances must be deemed fair. It was not until a short time before the beginning of the term that the announcement of the School could be put in circulation. A class of twenty received instruction, of whom four graduated with the degree of Doctor of Dental Surgery. We have aimed to make the course one of great thoroughness, and to a certain extent to grade the work. The exceptional advantages furnished to dental students by our medical college and our chemical laboratory must make this School especially attractive and serviceable to all who desire a complete knowledge of dental science. We desire to recognize with appreciation the hearty support and the timely help, which the dentists of Michigan have given to the School. If the attendance increases, as we have a right to expect it will, ampler accommodations will be needed. A somewhat larger annual appropriation is indeed quite indispensable to the largest prosperity of the School.

I desire to call the attention of the Legislature and of all the friends of the University, to the fact that the Acts establishing the School of Mines and the Dental School, provided only two years' support for those schools. Unless, therefore, the Legislature at its coming session, renews the appropriations, the existence of those two schools must terminate at the close of the present University year. It is to be hoped that the same generous spirit, which prompted the original endowment, will also lead the Legislature to provide for their continuance. They are both giving a promise of prosperity and usefulness, which justifies the fostering care of the State.

The Homœopathic Medical College started under special difficulties. Like the other new schools it had but small opportunity to make known in advance its plan. The plan, when announced, met with some spirited opposition from a certain number of homeopathic physicians in the State. A class of twenty-four attended the lectures, but as they were all first year students, none were prepared to graduate at the end of the term. There was, however, a good *esprit de corps* among the students, and now that the Faculty has been enlarged, the prospect for the School seems satisfactory.

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[*] A class of seven are pursuing this course In view of the brief notice which could be given of the details of the work, this must be regarded as a satisfactory number. Several other students regularly attend the lectures of the course.

Though it had been feared and predicted by many that the establishment of the Homœopathic Medical College would cause a great reduction in the number of students in the Department of Medicine and Surgery, (the old Medical College), yet three hundred and twelve were actually in attendance. While this is a somewhat smaller number than the average for several years past, it is almost exactly the same as the number in attendance in 1872–3. It is probable, however, that some were induced to go elsewhere on account of the founding of the Homœopathic College. Diligent, and I must be permitted to say, discourteous efforts were several times made by interested persons to breed disaffection among our students, and to frighten them away from here, under the warning that their time of study here would not be recognized at other schools, and that, if they graduated, their diplomas would not be accepted by the profession. These attempts to interfere with us failed of their end, and a class of about the usual size was graduated.

Much interest was very properly felt in our second year's trial of examinations for admission to the Medical School, since no other school in the country had yet ventured to take this slight step towards raising the grade of medical education.* We have been somewhat criticised, and singularly enough, by friends of schools which hold no examinations for entrance, because our examination papers were not more difficult. But easy as they were, making only a demand for a decent English education, they were severe enough to exclude several applicants, who, however, found no difficulty in gaining immediate admission to other schools. We shall continue to elevate the standard of examination just as rapidly as the diffusion of education among the class, which furnishes medical students and the co-operation of other schools will warrant.

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* The candidates for admission to the Dental School and to the Homœopathic Medical College were also subjected to the same examination.

Owing to various unforeseen delays, our new Hospital Buildings were not completed in time for occupancy last year. This was a serious disappointment. But we are now to enjoy the advantages, which they will offer, for clinical teaching. This will be a most valuable addition to our means of instruction. The buildings are so tasteful that they enhance the beauty of our grounds.

A considerable number of the medical profession have seen fit to indulge in very sharp criticisms of our Medical Faculty, the Regents and the Legislature, because students in the Homœopathic College are allowed to attend lectures in the old Medical School. I do not refer to this fact for the sake of discussing the position of these critics, but simply for the purpose of reminding you that these unpleasant attacks have not driven our Professors from their posts. In these most trying circumstances they have been faithful to the University, and are deserving of all commendation for their devotion to her interests. We have abundant and most gratifying proofs that the attacks which have been so freely made on us for our plan of furnishing medical education to students of two schools, have not diminished the respect and esteem in which the University is held by the citizens of this and other States.

The Law School has had a very prosperous year. Its hold upon the public seems to be deep and strong. Professor C. I. Walker, who had at our request held his resignation in abeyance for a year, was compelled by the pressure of his professional business to ask a permanent release from the duties of the chair which he had so long and so ably filled. We have been fortunate enough to secure as his successor, William P. Wells, Esq., who has so acceptably occupied the chair during the absence of Professor Walker.

The School of Pharmacy in its prosperity continues to make larger and larger demands especially upon the Professors and Instructors in Chemistry and Botany. In my opinion a larger force is now required for the proper instruction of our various classes in Chemistry. To a greater extent than is now possible, the instruction of the College class and of the Pharmacy class in Chemistry, should be separated. The graduating class in the Pharmacy School, in June, numbered thirty-one.

The Librarian's report shows that there have been added to the Library during the past year by purchase 332 volumes and 8 pamphlets, by gift 182 volumes and 131 pamphlets, and by binding 107 volumes. Total increase, 621 volumes and 139 pamphlets.

We are suffering a two-fold inconvenience. In the first place we are not able to supply by purchase more than a tenth of the books we most urgently need to purchase every year. In the second place our Library room is too small for the proper accommodation either of our books or of our readers. The Regents have directed a plan of a new building to be prepared, though private munificence, or public appropriation must furnish the means for erecting the building. If we are to have a great and flourishing University here, we must have a great Library. .

Our Museum continues to grow with a good degree of rapidity. The most valuable additions this year, have been those from the collections Prof. Steere made in Formosa and the Philippines. He has taken a portion of his collections to London to identify and name them. He finds that he has many new species of birds. The books of the Museum give the following figures: Added during the year, zoology; general donations, 325 species, 1,300 specimens. Prof. Steere's collection 23,900. Botany, general donations, 4,000 species, 6,000 specimens. Prof. Steere's collection, 2,506 specimens. Archæology; general donations, 14. The entire number of specimens in our Museum is nearly 255,000.

If the whole of the collection, which Prof. Steere has brought home, remains permanently with us, it is clear that we must have more spacious quarters for our Museum. We are already straitened for room. Our collections have already become so numerous that they naturally attract gifts. We are constantly receiving valuable donations. Persons, who wish to bestow choice specimens on some institution, generally prefer to add them to a choice collection. Since, also, we make it our constant study to increase our supply of illustrative scientific specimens, we may reasonably hope for a contiuous and rapid growth of our Museum. We must provide for such a growth. I think we have already reached the point where a new and commodious building for the storing of our collections, and perhaps for furnishing us a few more lecture rooms for classes in Science, a physical laboratory, and large working rooms for the instruction in mining and in architecture, is a real and pressing need. Whether such a building or a new Library building is most needed, it might be difficult to say. But it is not easy to see how we can long do our work with efficiency, unless we have them both. At your last meeting, you directed the Professor of Architecture to prepare a plan of an edifice suitable for both purposes. Reflection has brought me to the conclusion that it will be better to erect separate buildings for the Library and the Museum. To the Library a wing might be added for the Art Gallery. If for no other reason, I should recommend the separation of the Museum from the Library as a precaution against fire. But our friends everywhere should understand the serious inconvenience we are suffering for the lack of both buildings. If the present Museum is vacated, it will supply us with additional recitation rooms, for the want of which we are now, at times, somewhat embarrassed.

Prof. Frieze has this year kindly given himself the trouble to prepare and print a new and instructive catalogue of the collections in the Art gallery. It was a long and laborious task to edit the work with the critical care which he gave to it. This catalogue greatly enhances the value of the collections to all visitors.

At the request of the Centennial Commission from Michigan and of Governor Bagley, we sent to the Centennial Exhibition at Philadelphia, the following articles to form part of the educational exhibit of Michigan: A volume containing the last Triennial Catalogue, the last Annual Calendar, and a very succinct and interesting Historical Sketch of the University, which, at my request, Prof. C. K. Adams had the kindness to write, and Prof.

Frieze's catalogue of the Museum of Art and History. A volume containing Photographs of our Buildings. A volume of Engineering Drawings, executed by our students. Other Engineering Drawings, accompanying graduation theses. A volume of Drawings, illustrating microscopical studies in Botany. A similar volume of studies in Biology. A case of rare shells and one of rare birds from the Beal-Steere collection. (The cases were furnished by Mr. R. A. Beal.) A complete set of Pharmaceutical Preparations, as prepared by members of graduating classes in our school of Pharmacy. A chart, showing the full course of free public instruction in Michigan through the Primary, Grammar and High Schools and the University; also, through the Normal School and the Agricultural College. This chart was executed by order of Governor Bagley in our Engineering Department under the special direction of Instructor C. S. Denison. Lastly, a brief explanation prepared by Prof. Frieze, of the system represented on the chart. Onr contribution to the Exhibit seems to have been examined with interest by the students of our American educational systems; and has received the formal approbation of the Judges.

The Report of the Finance Committee, which is presented at this meeting, gives the details of our receipts and disbursements. Our income barely suffices to meet the pressing demands made by our large and varied work. It is only by denying ourselves help which we greatly need both in teachers and in means of illustrations that we are able to get on. When the Act granting us the one-twentieth mill tax was passed, we hoped that at the re-appraisal of the taxable property of the State in 1876, an increased valuation might yield us a somewhat larger income. But as the valuation stands unchanged, our resources are not enlarged. With a plain statement of our condition we must therefore leave our case in the hands of the people of Michigan, and ask them to do for us what seems to them wise. As we recall the generosity which they manifested through their Legislature two years ago, we do not suffer ourselves to doubt that the interests of the Institution, in which they have shown so much pride, are safe in their care.

Respectfully submitted, JAMES B. ANGELL.

APPENDIX A.

REPORT OF THE FINANCE COMMITTEE.

The Finance Committee submit the following report of the receipts and disbursements of the University for the fiscal year ending June 30th, 1876:

RECEIPTS. (*General Fund.*)

Balance in Treasury July 1st, 1875	$ 2,294	11
Received from the State Treasurer on account of University Interest Fund	38,427	23
Received from the State Treasurer on account of 1-20th Mill Tax	31,500	00
Received from the Steward on account of Students' Fees	29,800	00
Received on account of temporary loans	12,585	34
Received for interest on Treasurer's account	214	32

RECEIPTS. (*Special Fund.*)

Received from the State Treasurer on account of Water Supply	5,000	00
Received from the City of Ann Arbor for New Hospital Buildings and equipment	4,000	00
Received from the State Treasurer for New Hospital Buildings and equipment	8,000	00
Received from the State Treasurer for account of Homœopathic Medical College	6,000	00
Received from the State Treasurer for account of College of Dental Surgery	6,000	00
Received from the State Treasurer for account of Mining School Equipment	2,500	00
Received from the State Treasurer for account of General Expenses of Mining School	4,000	00
Total Receipts for the year	$150,321	00

DISBURSEMENTS.

Paid Salaries and Janitors' wages as per Pay Roll herewith submitted	70,816	25
Redemption of outstanding warrants	3,000	00
Accrued interest on outstanding warrants and temporary loans	257	07
Steward's disbursements as per vouchers herewith submitted	28,985	43
Steward's disbursements on account of Homœopathic Medical College Equipment	1,390	57
Steward's disbursements on account of the College of Dental Surgery	858	89

Steward's disbursements on account of the School of Mines	2,866 30
Steward's disbursement on account of the New Hospital Building and Equipment	10,887 72
Steward's disbursements on account of the Water Works,	7,212 43
Balance carried to new account	24,046 34
	$150,321 00

Of the above balance there was due for salaries on the 1stday of July, 1876, the sum of $17,020 82.

The warrants outstanding on the first day of July, 1876, were in amount $13,500. If we add to this the sum due for salaries on that day, namely $17,020 82, it will be observed that there was an actual indebtedness of $6,474 48.

The estimated receipts for the fiscal year ending June 30, 1877, are as follows:

Balance in the Treasury July 1, 1876	$ 24,046 34
For University interest	38,400 00
Students' Fees and Diplomas	27,000 00
Annual State aid, act of 1873, 1-20 Mill Tax	31,500 00
Annual State aid, act of 1875, Homœopathic Medical College	6,000 00
Annual State aid, act of 1875, School of Mines	10,500 00
For chemicals and apparatus, Chemical Laboratory	6,000 00
	$ 143,446 34

The disbursements for the same time are estimated as follows:

For salaries of Professors in all of the departments and for Janitors' wages	$90,900 00
For repairs and alterations	2,000 00
For fuel and light	5,000 00
For Libraries	3,000 00
For Insurance	2,500 00
For Annual Calendar	1,500 00
For Hospital	1,000 00
For improvements of the grounds	500 00
For postage	500 00
For Regents' expenses	750 00
For Steward's contingent expense account	5,000 00
For Homœopathic Medical College (current expenses)	600 00
For College of Dental Surgery (current expenses)	400 00
For Chemical Laboratory (current expenses)	6,000 00
For Museum and Microscopical room	1,000 00
For Physics and Engineering department	1,000 00
For redemption of outstanding warrants	13,500 00
	$135,150 00

The condition of what are called "Special Accounts" as stated by the Treasurer in his report, is as follows:

I. WATER SUPPLY ACCOUNT.

The amount received from the State Treasurer and covered into this account is	$ 5,000 00
The disbursements to date have been	7,212 43
The excess of expenditures $ 2,212 43 which has been paid from General Fund	

II. NEW HOSPITAL BUILDING AND EQUIPMENT ACCOUNT.

The receipts carried into this fund are as follows:

1875.		
September 1, received from the City of Ann Arbor	$4,000 00	
October 27, received from State Treasurer for construction	5,500 00	
October 27, received from State Treasurer for equipment account	2,500 00	
		$12,000 00
October 27, disbursed for construction	$9,271 00	
October 27, disbursed for equipment	1,606 72	
		$10.877 72
Balance in the Treasury		$ 1.122 28

III. HOMŒOPATHIC MEDICAL COLLEGE.

1876.	
January 25, amount secured from State Treasurer	$ 6,000 00
January 25, amount disbursed	4,990 57
Unexpended balance in the Treasury	$ 1,009 43

IV. THE DENTAL SCHOOL.

The receipts placed to the order of this account are as follows:

1876.		
January 26, received from State Treasurer	$3,000 00	
March 14, received from State Treasurer	3,000 00	
		$ 6,000 00
Disbursements to date		3,458 89
Unexpended balance in the Treasury		$ 2,541 11

V. THE SCHOOL OF MINES.

1876.		
February 3, received from State Treasurer for equipment account	$2,500 00	
February 3, disbursements to date have been	2,866 30	
Excess of disbursements		$ 366 30
May 4, received from State Treasurer for account of current expenses	$4,000 00	
May 4, disbursements on account of current expenses to date	2,500 00	
Balance to credit of current expense account.		$ 1,500 00

There has been received at the Chemical Laboratory from the sale of chemicals, apparatus etc., during the year ending June 30, 1876, the sum of $6,996 74. The disbursements for the expenses of the Laboratory during the same time were $6.066 59, showing an excess of receipts of $930 15.

The annual report of the Treasurer with a full list of all the warrants paid by him is herewith submitted. This list of warrants has been carefully compared with the books of the Secretary and found to be correct.

Your committee submit herewith a list of all of the officers, Professors and employes of the University, showing the amount of salary paid each.

In submitting the foregoing report, your Committee would call attention to the ever recurring closeness with which the funds of the University are consumed. The fields of labor are large, and we presume such will always be the case. We are confident that our funds have been wisely expended, and that as much has been accomplished as could be expected.

SAMUEL S. WALKER,
Of the Finance Committee.

APPENDIX B.

PROFESSOR PETTEE'S REPORT ON THE SCHOOL OF MINES.

To the President of the University:

DEAR SIR:—In view of the approaching meeting of the Board of Regents, I beg leave to submit the following report and suggestions in relation to the School of Mines.

The amount of the special fund provided by the last Legislature for the equipment of the School, exclusive of salaries, was five thousand dollars. One-third of this sum was set aside at the June meeting of the Board for the use of the Department of Architecture and Design. The remainder, with the exception of a small balance of less than seventy-five dollars, hardly sufficient to cover the necessary incidental outlays of the current year, has been expended under the direction of the Professors of Metallurgy and Mining Engineering. The statement below shows in round numbers how much has been used for the different purposes specified.

Cost of material and labor in fitting up metallurgical laboratory	$425 00
Melting furnaces, forge and settings	650 00
Assay furnaces, tools, apparatus, and stock	425 00
Laboratory crusher	50 00
Stamp mill, extra parts, shafting and labor	400 00
Stock of gold, silver, and lead ores	225 00
Balances and appurtenances	210 00
Cost of material and labor in fitting up balance room	200 00
Mineral collection for the use of students, and set of glass crystal models	350 00
Mining, metallurgical, and geological drawings and tracings	50 00
Freight and express bills	125 00
Printing, advertising, and traveling expenses	150 00
Total	$3,260 00

Nothing further can be added to the equipment of the school, without aid from the Legislature or from some other source.

In the metallurgical laboratory as now equipped, there are good facilities for giving instruction in Assaying, but for the illustration of more extensive operations and the important methods employed in actual practice, other appliances will be needed. A reverberatory furnace and a small blast furnace ought to be erected at an early day.

The ores of gold, silver, and lead, with which the laboratory has been stocked, were obtained in part from the Wyandotte Silver Works, and in part through the kind assistance of Mr. A. B. Wood, of Ann Arbor, from Colorado. They are mostly of high grade, and are well adapted for the use of students beginning the subject of Assaying. The price paid for them was simply their market value, reference being had solely to the amount of metal contained, as shown by the assays. The laboratory now needs a supply of ores of lower grade, and large quantities of copper rock and iron ores from Lake Superior and other mineral regions. The chief item of cost of such ores will be the transportation from the mines.

The value of this laboratory to the University is not to be estimated by the number of students entered upon the annual calendar under the head of Mining Engineering. The courses in Determinative Mineralogy, Blow-pipe Analysis, and Assaying, have proved attractive to students, whose principal work was in other departments, and there will undoubtedly be in the future a large number each year of special students, who wish to obtain a knowledge of Mineralogy, or Assaying, without being able to spend the time necessary for a complete course of study. It seems to be a good policy for the School of Mines to encourage such students, as far as it can be done without detriment to the work of regular classes.

In connection with the laboratory a beginning has been made toward the formation of a metallurgic and industrial cabinet. Through Mr. C. R. Wells, of Bay City, a collection of iron ores and products, comprising one hundred specimens, has been secured for this cabinet from Cincinnati, and Mr. D. T. McDonald, of Calumet, has sent a set of sixteen specimens of copper and silver ores from Lake Superior. Messrs. Rhodes & Co., of Cleveland, have expressed a willingness to place at the disposal of the University their valuable collection of iron ores and manufactured products, now on exhibition at Philadelphia. Mr. S. W. Baird, of Cincinnati, agent of the Selma, Rome and Dalton Railroad, has also generously offered to give to the University a collection of mineral specimens, selected from the exhibit made by that road at the Centennial exhibition, at no expense to us but the freight. This offer has been accepted, and correspondence has been opened with other exhibitors, with good prospects of receiving other contributions similar in kind. A set of forty-two samples, to illustrate the method of separating the metallic copper from the enclosing rock, was collected by myself at the Atlantic Mill, near Houghton, last June, and will be ready for exhibition as soon as the proper bottles for it are received. For this collection the thanks of the school are really due to Mr. W. J. Evans, superintendent of the mill, who freely granted me every desired facility, and spent himself the greater part of one day in the work of collecting. From Mr. A. J. Corey, Superintendent of the Quincy Mine, I also obtained a diamond drill core, illustrating the character of the country rock.

The mineral collection purchased for the use of the students, comprises between 675 and 700 specimens. It is at present kept in drawers in the room adjoining the geological lecture room, where it is easy of access whenever wanted. A few of the glass crystal models imported from Germany a year ago, were injured in transportation. It will be desirable to replace these with new ones, and to purchase about fifty models in addition to what we now have. The number of wooden models can also be increased to advantage.

For the illustration of lectures to be given in Geology, Mining, and Metallurgy, wall diagrams in considerable quantity will have to be provided. The most satisfactory way of supplying our needs in this direction will be by employing a competent draughtsman upon the work for two or three months, or longer if necessary. Models of furnaces and of such mining machinery as cannot be sufficiently well illustrated by diagrams will also be needed.

The model of the stamp mill of the Calumet and Hecla Mining Co., presented by the Company, will be of great use to us. The gift is as timely as it is munificent.

The general library, as is well known, is poor in the literature of mining and metallurgy; and the small annual allowance from the library fund is insufficient to supply the deficiencies. It is hoped that the next legislature will appropriate a generous sum, to be available for the purchase of books.

The distance of the University from the mining regions of the country is so great that it will not be practicable to arrange for very frequent excursions to places where works of the kind described in the text-books and lectures are to be seen in actual operation. In place of such excursions, which might be made extremely profitable to the students, it is recommended that portions of the long vacation be regularly devoted to field instruction. Summer schools could be established at such places as Marquette, Ishpeming, or Houghton—at different places in different years—where the students, under the guidance of the professor or other instructor, could acquire an insight into the methods of actual practice. A portion of the time could be spent in visiting the mines, mills, and furnaces of the neighborhood, and the remainder in arranging notes, collecting specimens, and preparing a detailed report upon the work of the season. The chief objection to such a scheme will doubtless be the expense, and the objection is in truth a serious one. Still, in consideration of the positive advantages to be gained, it seems worth while to make the suggestion at this time, in the hope that some means may be devised for carrying it into effect.

No large sum would be required for the general expense of such a school. It is the increased personal outlay, both in the case of student and of instructors, for which provision would have to be made. If there were a permanent fund, created by voluntary subscription, or by an act of the Legislature, the income of which could be used, under the direction of the Board of Regents, for paying a portion of the extra expenses incurred by meritorious students, the remaining difficulties could be easily overcome.

During the past year there has been considerable discussion, both in public and private, among the leading civil and mining engineers of the country, upon the subject of technical education. The discussion has not yet led to the adoption of any definite plan of action, but there is one point upon which there has been great unanimity of opinion; and that is, the undesirability of conferring upon young men, at the time of their graduation, the degrees of Civil Engineer and of Mining Engineer. The reasons for this opinion are not difficult to understand; but whether it would be a wise policy foı this University to make any change in the style of degree, which it confers, is a question of a complicated character, but it is a question liable to be called up for discussion at an early day.

Respectfully submitted,

W. H. PETTEE,

October 14, 1876. Professor of Mining Engineering.

APPENDIX C.

OUTLINE OF THE EDUCATIONAL SYSTEM OF MICHIGAN.

The following is an extract from the descriptive key to the chart, which presents a tabular view of the educational system of Michigan, and which was exhibited at Philadelphia. This key was prepared by Professor Frieze:

The State of Michigan has, by constitutional provisions, by legislative enactments, and by municipal ordinances subsidiary thereto, established and carried into successful operation, A SYSTEM OF FREE EDUCATION, embracing:

First, all grades of *general education* from the primary school to the highest university courses of stndy in literature, science, and the arts; and

Second, all branches of TECHNICAL AND PROFESSIONAL education, with the exception of military science and of theology.

The accompanying chart is intended to present to the eye in a tabular view the various courses of study in *general education*, in all their grades and connections, as organized in the several divisions, from the lowest to the highest; and, also, the courses of *technical* and *professional* studies established in the special schools.

I. General Education.

Under this head are placed, First, the Primary or Rudimentary schools; Second, the Grammar or Intermediate schools; Third, the High schools; and, Fourth, the Collegiate, Academic, or non-professional department of the University.

Each of these divisions, it will be perceived, embraces a course of four years of study; and thus the entire course of elementary and liberal education covers a period of sixteen years.

The conditions of promotion from one grade to another become more uniform, and also more exacting and severe, from year to year, in consequence, first, of the frequent interchange of views amongst the teaching corps, especially at their annual conventions, at their occasional institutes, and through their State magazine; secondly, of the influence of the State superintendency, and the annual report of the State Superintendent of education; and, lastly, by the close connection existing between the leading high schools and the University, which reacts upon the schools, by promoting a more uniform, and constantly stimulating to a higher, standard of scholarship.

In explanation of the last statement, it should be remarked, that a system of visiting and inspection has been established, by which committees of the Faculty of the University, by request of the school boards, annually visit and examine those high schools which have organized courses preparatory to the University: and by which, when such schools are reported favorably to the Faculty, their graduates are admitted to the University on presentation of the High School diploma, and without further examination.

As a necessary result of this correlation, the High Schools have organized their preparatory departments with parallel courses of study, each course affording the preparation necessary for admission to the corresponding course in the academic department of the University.

The effect of this system has been to bring the schools into a close and vital connection with the University, and to quicken and energize the educational work in all its grades, from the lowest to the high.

The parallel courses of studies above referred to are, First, the Classical; Second, the Latin-Scientific; and, Third, the Scientific. These are pursued in the High Schools for the period of four years, and continued in the University to the period of graduation with the first degree.

The academic department of the University also affords the opportunity to post-graduates, of study and examination for the degrees of Master of Science, Master of Philosophy, Master of Arts, and Doctor of Philosophy.

II. Special Education.

The schools for technical and professional education, with the exception of the Normal and Agricultural Schools, are organically connected with the University; forming, with the non-professional department, one institution under the control of the State board of regents.

These special schools are:

First. The Polytechnic School, embracing a *course of civil engineering, a school of mines, a school of architecture, courses of special and advanced studies in science, and a school of pharmacy.*

Second. A Department of Medicine and Surgery.

Third. A Department of Law.

Fourth. A Homœopathic Medical College.

Fifth. A School of Dental Surgery.

The State Normal School and the State Agricultural College are organized independently of the University and of each other, and are under the control of the State Board of Education.

An inspection of the chart will show that in all the technical and professional schools ample provision is made for all the courses of study appropriate to such institutions.

It will be perceived by this brief outline, that the free educational system of Michigan embraces very nearly all that can properly be included in the public education of a republican State. Theology is necessarily excluded. Military education has hitherto been omitted.

In conclusion, it should be observed that this system is in active and complete operation, from the elementary schools and the high schools, to the culmination of the whole in the highest studies of the University.

UNIVERSITY OF MICHIGAN.

THE

PRESIDENT'S REPORT

TO THE

BOARD OF REGENTS

FOR

THE YEAR ENDING JUNE 30, 1877.

ANN ARBOR:
PUBLISHED BY THE UNIVERSITY.
1877.

ANN ARBOR PRINTING AND PUBLISHING COMPANY.

PRESIDENT'S ANNUAL REPORT.

To the Honorable the Board of Regents:

I have the honor to present my report for the year ending June 30, 1877.

The following changes have taken place in our Faculties:

In March, 1877, Silas H. Douglas, M. A., M. D., Professor of Metallurgy and Chemical Technology and Director of the Chemical Laboratory, was dismissed. In June, 1877, Raymond C. Davis was appointed Librarian to succeed Rev. Andrew Ten Brook, M. A., on the first of October. Owing to the failure of appropriations for the School of Mines (including the School of Architecture), W. L B. Jenney, C. E., Professor of Architecture and Design, asked and received leave of absence for two years, and W. H. Pettee. M. A., Professor of Mining Engineering, resigned his chair. Prof. Pettee was then appointed Professor of Geology, in charge of Mining Engineering. John W. Langley, S. B., M. D., who had filled the chair of General Chemistry and Physics, was made Professor of General Chemistry, in charge of Metallurgy. Charles K. Wead, M. A., was elected Acting Professor of Physics. The resignation of Mark W. Harrington, M. A., Assistant Professor in charge of Zoölogy and Botany, was accepted. The title of Joseph B. Steere, Ph. D., was changed so as to read, Assistant Professor of Zoölogy and Paleontology. Volney M. Spalding, M. A,, was elected for another year Instructor in Zoölogy and Botany. Otis C. Johnson, M. A., Assistant in the Chemical Laboratory, was appointed also Purchasing Agent for the Laboratory. Owing to the pecuniary necessity of reducing for the present the number of our teachers, leave of absence for an indefinite period was granted to Alfred Hennequin, M. A., Instructor in French and German, to Charles N. Jones, M. A., Instructor in Mathematics, and to Abram V. E. Young, Ph. B., Ph. C., Assistant in Chemistry and Physics. The

Executive Committee, under instructions given them at the June meeting, have appointed Miss Louisa M. Reed. M. S., Assistant in the Microscopical Laboratory, D. J. Higley, B. A., Assistant in the Museum, Henry B. Parsons, Ph. C., and Henry Stecher, Assistants in the Chemical Laboratory, and William H. Dorrance, Demonstrator in the Dental College. Charles H. Stowell, M. D., was appointed in June Instructor in the Physiological Laboratory.

In the Homœopathic Medical College John G. Gilchrist, M. D., was appointed Lecturer on Surgical Therapeutics for the coming year, and W. J. Hawkes, M. D., was elected Professor of Theory and Practice of Medicine in place of J. C. Morgan, M. D.

The number actually engaged in instruction last year was fifty-one. Two Assistant Professors were absent by permission, pursuing studies in Europe.

The attendance of students was as follows:

Department of Literature, Science, and The Arts.

RESIDENT GRADUATES		14
SENIORS		64
JUNIORS		73
SOPHOMORES		71
FRESHMEN		132
IN SELECT STUDIES		15
Total		369

School of Pharmacy.

SECOND YEAR	29	
FIRST YEAR	35	
		64

Department of Law.

SENIORS	124	
JUNIORS	185	
		309

Department of Medicine and Surgery.

STUDENTS—Total		285

Homœopathic Medical College.

STUDENTS—Total		51

Dental College.

STUDENTS—Total		33
		1111
Deduct name twice mentioned		1
Total in the University		1110

A few more than half of the total number, to be exact, 52 per cent. were Michigan students. In the year previous, exactly one-half were from our State. The proportion of Michigan students to the whole number is slowly increasing from year to year. Still the attendance from other States is gratifying. Last year Illinois sent us 103, Ohio 72, New York 71, Pennsylvania 41, Indiana 37, Wisconsin 30, Minnesota 27, Iowa 17, Missouri 16, Kansas 13, California 13. As usual, we had representatives from all the New England States. We had one student from Russia, one Armenian from Asiatic Turkey, and one Japanese.

The number of women in attendance was 97, as follows: Department of Medicine and Surgery, 36; Homœopathic Medical College, 9; Law Department, 2; School of Pharmacy, 2; Department of Literature, Science and the Arts, 48. These last were distributed thus: Resident Graduate, 1, Seniors, 12, Juniors, 8, Sophomores, 9, Freshmen, 15, Select Courses, 3. The proportion of women to men scarcely changes from year to year. The women form a little less than nine per cent. of the whole number of students. It is very gratifying to see how readily the more gifted young women, who have graduated here, especially those who have taken the classical course, have secured conspicuous positions as teachers in High Schools, Seminaries of advanced grade, and Colleges for women. In those positions they are justifying the wisdom of the Regents, who opened to them the opportunities for a thorough collegiate training in this institution, and are doing their full part in winning a reputation for the University. Since we are pledged to the co-education of the sexes, it is with special interest that we see one after another of the higher schools of Europe admitting women to courses of study and to degrees, and that we see women, there as here, winning their fair share of the honors awarded to brilliant scholarship.

Degrees were conferred during the past year as follows:

Pharmaceutical Chemist	28
Civil Engineer	5
Bachelor of Science	11
Bachelor of Philosophy	19

Bachelor of Arts	39
Master of Science (in course)	2
Master of Science (on examination)	1
Master of Philosophy (in course)	3
Master of Philosophy (on examination)	1
Master of Arts (in course)	22
Master of Arts (on examination)	2
Doctor of Medicine(Dept. of Medicine and Surgery)	84
Bachelor of Laws	122
Doctor of Medicine(Homœopathic College)	13
Doctor of Dental Surgery	10
Total	362

Henceforth no second degrees in course are to be given. We may therefore reasonably expect that the number of applicants for the degrees on examination will increase. We desire it to be understood that the examinations for the second degrees are by no means a mere form. We make them rigorous and searching. We intend that the degrees shall have a real significance. It is a question worthy of consideration whether candidates for the first degree might not well be subjected to some special examination in addition to the term examinations, which they now receive. Such an examination, if held, should probably not be technical and directed to minute details, but should rather call for a broad and comprehensive survey of the course pursued or of the last two years of it.

We received last year 55 students on diploma from the following High Schools, from Ann Arbor, 29; from Battle Creek, 1; from Coldwater, 4; from Detroit, 1; from Fenton, 2; from Flint, 1; from Grand Rapids, 4; from Jackson, 4; from Niles, 4; from Pontiac, 4; from Ypsilanti, 1. This system of receiving students from approved schools continues to justify itself. We take some students, it is true, who ought not to have been sent to us, and who prove incompetent to go on with the class. But we always take some such on examination. And if in any case a Superintendent has been lax in scrutinizing the attainments of a pupil, whom he has recommended to us, the dropping of the pupil from our class with a kind and frank statement of the facts to the Superintendent has always proved a sufficient incentive to him to greater caution the next year. I cannot repeat with too much emphasis my testimony to the fidelity and earnestness of the Superintendents and teachers of our principal High Schools in directing the preparatory work for the University. I am gratified to say also that the work shows a steady and rapid increase in its thoroughness and range, and that the schools are in every respect worthy of the pride which is felt in them. Whatever success the University is achieving is due in no small degree to the excellence of the schools, which give their pupils so good a foundation for their studies here. It is to be hoped that no unwise and false ideas of economy will lead to the weakening of the High Schools of Michigan.

The custom of receiving students without examination from approved schools is rapidly extending. Not only has it been adopted in some of the State Universities of the west, but some of the eastern colleges are receiving students without examination from academies of established reputation. I think their example will be imitated by other colleges.

The Act passed in 1873, establishing a School of Mines here (including also a School of Architecture) made provision for its support for only two years. The Regents organized the School so that it began the work in Mining Engineering in the autumn of 1875. The instruction in Architecture was delayed until the autumn of 1876. Nearly the whole of the sum of five thousand dollars appropriated for apparatus has been expended, two-thirds of the amount on the apparatus for the mining work, and one-third on the apparatus for the Architectural School. Competent professors have been secured, and students have been attracted in good numbers from various parts of the Union. We had every reason to expect a satisfactory career for the Schools. To our great regret the Legislature failed to continue the appropriations for their support. We could spare nothing from our general fund to carry them on. It was a grave question whether we should not drop them altogether, in spite of the great disappointment to the students, who had been drawn hither by the assurance that we could give them full courses of instruction in Mining and Architecture. But Prof. Langley having kindly offered to give for the present the instruction in Metallurgy in addition to his regular duties, and Prof. Pettee having also offered to teach Mining Engineering in addition to his duties as Professor of Geology, (both of them without any compensation for the extra work), we are able to continue to care for the students in Mining. But I am sorry to say that the instruction in Architecture must be suspended until from some source we can receive more funds. The class in Architecture were pursuing their study with great enthusiasm and with excellent promise. Surely in the downfall of badly planned and ill-constructed buildings, causing not only destruction of property but also of life, we are receiving eloquent appeals for the thorough training of architects. We do not need to leave our own grounds to be reminded of the advantages which might accrue to us from the employment of architects of chaste and cultivated taste.

The School of Mines was not established at our solicitation, but on the suggestion of intelligent legislators from the Upper Peninsula. It was they also, who decided that this was the proper place for it. We were gratified at their decision, and have gladly and in good faith labored to make the school meet their expectations as far as was possible in this brief period. It is therefore with peculiar regret that we learn that the failure to renew our appropriations for the school was due in part at least to an attempt of members of the Legislature from the Upper Peninsula to transfer the school from Ann Arbor to some point in the mining districts. The bill, which was introduced to effect the removal, proposed however to leave the school in the control of the Regents and so a part of the University.

I think I appreciate the force of the arguments for the establishment of the school in the mining regions. I would not undervalue them. It is unquestionably advantageous, nay, it is absolutely necessary that the students should spend some time with their instructors at the mines. But conceding this, it seems to me by no means proved that the school should be altogether removed from the University. The results desired can be as successfully and far more economically secured by leaving the main part of the class-room work to be done at the University and by establishing a summer school for the students near the mines. If a separate school is established, a large part of the expense already incurred must be duplicated. Furnaces, models, crushers, and other apparatus like that already procured at an expense of nearly four thousand dollars must be obtained. Such collections as we possess for illustrating the general scientific teaching, which is a part of the thorough education of a Mining Engineer, could be gathered only at great cost and trouble and after a long time. A laboratory for chemical and metallurgical and assaying work would be a necessity and must involve a large outlay. But perhaps the increased cost of instruction would be a more serious matter still. To give the needed teaching in mathematics, the languages, and the sciences, would require a considerable corps of professors and assistants in a separate school. At the University all that part of the instruction of the students is done without the cost of an additional penny to the State. It need hardly be said that all this teaching, which is not purely technical, can be done quite as well here as in the Upper Peninsula. Add to this the benefits to be derived from the library and the general advantages of culture afforded by life at the University, and it seems clear that the school should be retained here. But must the students forego the opportunity to observe actual work at the mines? By no means. They should be required, and if necessary, be aided to spend some time there during each of the two last years of their course. Appended to my last report was a somewhat detailed sketch by Prof. Pettee of a plan for such a summer school. It is estimated that two thousand dollars a year will suffice to meet its expenses. The students could spend a part of their time at the iron mines, and a part at the copper mines, and could reap all the substantial benefits to be derived from a permanent school in the mining districts and also the benefits of life at the University, and their instruction would cost the State less by many thousands of dollars annually than it would, if the school should be transferred from Ann Arbor to any point in the Upper Peninsula.

While I deem it an advantage to the University to have the school here, I would not say a word to keep it here, if I did not think it best for the State that it should not be removed. And although we shall try even at great inconvenience to carry it on for the present, yet the arrangement now made cannot easily be continued for a long time. If the next Legislature, speaking for the State, do not wish us to take charge of this work, nay, if the citizens of the Upper Peninsula after careful reflection wish us to drop it, I strongly recommend that we abandon our effort to carry it on. Yet I cannot but think that the considerations here presented will ultimately lead the State to the conviction that if a School of Mines is to be maintained at all, the plan which has here been commended is the wisest one to be pursued.

The history of the legislation on the School of Mines must impress all, who bestow any careful thought on the subject, with the desirableness of having legislative action, which affects the University, shaped so far as possible with relation to some fixed and definite plan of development of the institution. To establish a school, and just as it is fairly organized to destroy it, not only disappoints and incommodes the teachers and students in that school, it must make it difficult to secure accomplished professors and earnest students for other schools in the University, since, rightly or wrongly, they infer that there is instability in the whole institution. Of course one legislature cannot control the action of its successors. But reflection upon the evil results of a vacillating policy towards the University must impress all wise legislators with the importance of avoiding hasty and frequent changes in its organization and work.

The School of Pharmacy, which has heretofore been treated in our Calendar as a part of the Department of Literatnre, Science and the Arts, was, at the request of the officers of instruction in the School, in December, 1876, recognized by you as a separate organization. It had long been so in fact. Its students are to a very small extent, instructed with the classes in the Literary Department, and they have never been governed or directed by the Faculty of that Department. Their course is purely technical. They will henceforth feel an increased pride in their School, and will cheerfully co-operate with the Faculty in raising its grade of work. The elevation of the standard of admission will apparently become a necessity, if for no other reason, in order to prevent the classes from becoming too large for our accommodations. The growth of the School has been natural and steady, its courses of study have been made broader and more thorough and exacting from year to year, and its graduates are doing credit to the training they have received.

The Law School goes steadily on in its prosperous course with scarcely any fluctuation in its numbers. Its Faculty have made so few demands on the Board for help, that possibly there is danger that we fail to inquire with sufficient care whether its resources should not at the earliest practicable day, be somewhat enlarged. While pains have been taken to raise the requirements for admission and for graduation in the Literary and Medical Departments, and to lengthen the term of study in the Medical Schools, the whole scheme of labor in the Law School has remained unchanged. It is worthy of consideration whether something may not be done to increase the efficiency of the School. I think it would be gratifying to the Faculty and conducive to the best interests of the School, if another Professor could be appointed, and if more of what we may term class-room work, drilling, quizzing, could thus be secured. It is also my own conviction that there should be some test of admission to the School, or at any rate of admission to the senior class. The subject of legal education and especially of the best methods of training men in law schools for the legal profession, is receiving large attention just now throughout the country, and we must spare no pains to retain for our School the high reputation it has always enjoyed.

The Dental School has had a year of satisfactory work. We have reason to believe that it has commended itself to the Dental Profession in the west, and now that the action of the Legislature has removed all doubts of its continuance, we may expect an increased attendance. It is now provided with its own building, and the inconveniences under which it and the Homœopathic College suffered from being crowded into the same edifice with inadequate room, will henceforth be avoided.

The Department of Medicine and Surgery, in spite of bitter attacks upon it on account of the establishment of the Homœopathic Medical College here, and in spite of the predictions, which its enemies have indulged in, of its approaching decline, persists in continuing a vigorous existence. Indeed, it is taking a bold step forward. With a view to insuring larger attainments in its graduates, it now extends its annual course from six months to nine months, and so grades the work as to secure an orderly and systematic education. Only two other Schools in the country, those at Harvard College and the University of Pennsylvania, have attempted this marked improvement in medical education. But all over the land there is among the more intelligent members of the medical profession a profound conviction that an elevation of the standard of medical education is in the highest degree necessary. Yet since a large proportion of the schools graduate students after two courses of six months each, or even of four months each, while we ask an attendance on two courses of nine months, and by rigid examinations make stringent demands on the candidate for graduation, we were prepared to expect, at first, a considerable decline in the attendance. But as the school at Harvard after an experiment of three or four years has fully regained its old numbers, so we hoped that after a brief period we should enroll as many on our books as we had been accustomed to see for the years past. But whether we did or not, we resolved to adhere so long as the resources of the University would permit, to the policy of giving the highest grade of medical education which is provided in the best schools of the land. That we deemed the only course worthy of a University. We believed that if a few of the leading schools would courageously persist in this policy, they would not only attract the choicest and most aspiring students, but they would soon lift many of the other schools to a higher plane, and so compel the much needed elevation of the training of the medical profession.

But to our great gratification we find, as our new year opens, that our expectation of a decline in attendance is disappointed. The classes bid fair to exceed in size those of last year. And it is a cause of especial encouragement that students, who have come from distant States, as well as some who have come from our own State, assure us that they have been attracted hither by the extension of our term. They desire the largest and best training they can secure. They do not ask, what is the shortest time, in which we can obtain a diploma? They seek rather the fullest preparation for their professional work. That is the class of students we have hoped to secure.

The Homœopathic Medical College had fully twice as many students last year as in the preceding year, and the number this year promises to be at least half larger than it was last year. A growth so rapid ought to be satisfactory to its friends. Now that it may be said to have passed its experimental stage and that its existence is assured, it is reasonable to expect that the Homœopathic branch of the medical profession will lend it a cordial support. It will be borne in mind that the course in this school is also lengthened from six months to nine months. The remarks made above concerning the importance of the extended course in the Department of Medicine and Surgery, are, of course, equally applicable to the Homœopathic practitioners and schools. This is the only Homœopathic School which has courses of nine months, and it must attract the students, who desire a thorough training.

Legislative action has brought some very valuable addition to our resources for furnishing medical education by aiding in the support of the hospital and by establishing a Physiological Laboratory. Our funds have heretofore enabled us to keep the Hospital open only a part of the year, and have not sufficed to care for it as we could have wished. But the appropriation made at the last session of the Legislature will enable us to provide for patients through the whole year and insure them every needed comfort. During the last year a large number of important operation in surgery and on the eye and the ear have been successfully, and of course gratuitously performed, and so the Hospital has been a great public benefit to the State, which supports it. But it will now be able to multiply its blessings, while it also becomes a more valuable adjunct to the Medical Schools. A portion of the Hospital is to be set apart for the use of the Homœopathic College and of the patients who prefer to be treated by Professors of that school.

The Physiological and Histological Laboratory we also expect to be of the greatest service to the medical students, who may avail themselves of its advantages. By experiments upon the lower animals and by the use of the microscope and other instruments of observation, the minute and scientific study of the structure of the tissues and of the various parts of the human organism both in the diseased and in the healthy state is pursued with the most helpful results.

We may therefore confidently affirm that our provisions for instruction in medicine are not only materially ampler and better than they have ever before been, but that we may reasonably expect them to draw to our halls those earnest men and women, who are not content to receive the minimum of knowledge with which they can be allowed to practice medicine, but who aspire to that complete and generous training, which shall prepare them to adorn their profession and bless their generation. Even if the number of such should not prove as great as the number of those, who wish for a mere smattering of medical learning, and who are willing to play the part of ignoramuses or charlatans, it is very clear that we should not mourn over the loss of the latter class from our lecture-rooms, but should use every worthy means to stimulate and prepare the thorough and high-minded students for the best work of which they are capable. But the large classes who are thronging the medical lecture-rooms this year indicate that the sentiment of the medical profession in favor of improving medical education was riper than some had supposed, and that the proportion of students who earnestly desire prolonged and thorough instruction, is already very great. We may well be cheered and encouraged by the response which is thus made to our endeavor to lift the standard of medical education.

The Legislative Committee made a very careful inquiry into the condition and wants of the University, and presented a report with very generous recommendations in our behalf. Most of these recommendations, I am happy to say, were adopted. The following appropriations were made:*

For the salary of the Professor of Geology, for 1877, $2,000;

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* See the Act in Appendix B.

for 1878, $2,000. For the Physical Laboratory, 1877, $1,000; 1878, $500. For the salary of the Professor of Physics, 1877, $2,000; 1878, $2,000. For the Hospital, 1877, $2,000; 1878, $2,000. For the Physiological Laboratory, 1877, $2,500; 1878, $1,000. For the General Library, 1877, $2,500; 1878, $2,500. For salaries of Professors in the Dental School, 1877, $4,500; 1878, $4,500. For apparatus in the Dental School, 1877, $1,000; 1878, $500. For repairs of a building for the Dental School, $1,000. For the purchase of instruments for the Astronomical Department, $1,500. For the extension of the term in the Department of Medicine and Surgery to nine months, 1877, $4,500; 1878, $4,500. For the same extension of the term in the Homœopathic College, 1877, $2,500; 1878, $2,500.

Of the specific advantages to be derived from most of these appropriations, I have already spoken. But I desire to call especial attention to the legislation, which enables us to establish a fair equipment for a physical laboratory and to provide a Professor, whose whole attention can be given to instruction in Physics. For years we have been striving to bring to the study of Physics the same help from laboratory processes which has been furnished to the study of Chemistry and to some extent of the Natural Sciences. We have been compelled to see ourselves outstripped in that particular by many institutions, whose equipment in most respects was far inferior to ours. The introduction of the laboratory work renders the division of the duties of the chair of Physics and Chemistry an absolute necessity. We may now hope to do far more than we have ever before done in preparing students to investigate or to teach the science of Physics.

I would also refer to the appropriation for the increase of the General Library. The Legislative Committee appreciated, it is believed, the importance of a new fire-proof building for the Library, but did not deem it expedient, it is presumed, in the present depressed state of business to recommend the erection of it. They saw, however, how inadequate is the Library itself to the needs of such an institution as this, and wisely urged an appropriation of twenty-five hundred dollars for this year and an equal sum for the next. This will furnish a most welcome addition to our shelves and will enable us to do much towards filling some very bad gaps. The Library must be the fountain of strength in a University. If our collection of books were trebled or quadrupled in numbers at once, it would not be at all beyond the real demands of the institution. For in addition to a rich general library we ought to have for each of our special and professional schools a large and choice technical library. We trust that coming Legislatures may imitate the last in an appreciative care for the Library, unless private munificence should make provision for it. I cannot relinquish the belief that some man will yet be wise enough to link his name permanently with the University by erecting us a suitable building for the Library.

The total sum appropriated is for 1877, $27,000, and for 1878, $22,500. The aid thus furnished will prove very helpful to us by enabling us to enlarge our facilities for instruction in various ways. We appreciate it also at this time as an encouraging evidence that even when a temporary excitement caused by exceptional circumstances might be supposed to precludethe hope of generous appropriations from the Legislature, yet that body could be relied on to express by its action the deep interest which the citizens of Michigan really feel in the prosperity and efficiency of this institution.

But it must not be forgotten that the demands upon us are constantly outrunning our resources. A great institution with a worthy ambition and a vigorous life, is constantly tending to expand its work and is ever tempted to increase little by little its outlay in order to enrich its instruction. But with a firm resolve to keep out of debt, we have decided for the present to reduce slightly our teaching force and increase the labor of the instructors and to curtail our present and miscellaneous expenses to the last degree compatible with the continuance of our work in a manner worthy of our reputation. It is expected that a saving of several thousand dollars will be made for the current year, and of a sum nearly as large for the year to come. But this has been made possible only by placing on some of our college officers an amount of class-room work with undergraduates, which, for the best good of the University, they should not be asked to do permanently. There is ground for fear that the efficiency of some of our teaching will be impaired to a certain extent. Certain it is that less time can be given by some of our most experienced Professors to the higher grades of instruction, especially the work with resident graduates and specialists, than has been given, and with results which have reflected great credit upon us. The present reduction of our force is absolutely necessary. We must at all hazards keep out of debt. But it should be borne constantly in mind that the reduction in the Literary Department is in itself considered a misfortune, and therefore that if our number of students does not materially diminish, the number of our staff of teachers must be made good again as soon as our funds will allow.

In reviewing the year, we may say with truth that the work of the University in all its Departments has gone on with marked efficiency and success. The prosperity of the Institution, we believe, has not been checked even by the misfortune, which has made the Chemical Laboratory the object of an undesirable notoriety. With the fixed purpose to keep its expenses carefully within its income, to practice in every particular the utmost economy, and to secure the largest and best results, which its resources will allow, we are confident that the University will not forfeit the place it has so long held in the affections of the people of Michigan, nor lose the pre-eminence it has attained as an Institution of Higher Learning.

JAMES B. ANGELL.

APPENDIX A.

REPORT OF THE FINANCE COMMITTEE.

The Committee on Finance submit the following account of the financial condition of the University at the close of the fiscal year ending June 30th, 1877.

RECEIPTS. (*General Fund.*)

Balance in the Treasury July 1st, 1877	$ 24,046 34
Received from the State Treasurer on account Interest Fund (three quarters)	24,774 40
Received from the State Treasurer on account 1-20 Mill Tax (three quarters	23,625 00
Received from Steward for Students' Fees and Laboratory Receipts	34,570 00
Received on account of temporary loans	17,000 00
Received for interest on Treasurer's account	155 12
Received for unexpended balance of Centennial appropriation covered back into Treasury	32 30

RECEIPTS. (*Special Fund.*)

Received from State Treasurer on account of Homœopathic Medical College	6,000 00
Received from State Treasurer for Current Expenses of Mining School	8,000 00
Received from State Treasurer for Equipment of Mining School	2,000 00
	$140,203 16

DISBURSEMENTS.

Paid Salaries of Officers, Professors, and other employees of the University as per Pay Rolls submitted	$ 92,105 82
Paid Temporary Loans	12,585 34
Paid Outstanding Laboratory Building Warrant	500 00
Paid Interest on Loans and Warrant	508 31
Treasurer's disbursements as per vouchers herewith submitted	29,647 41
Treasurer's disbursements on account of the Homœopathic	

Medical College	614 83
Treasurer's disbursements on account of the Dental College	822 03
Treasurer's disbursements for current expenses of Mining School	258 20
Treasurer's disbursements for Mining School equipment	1,882 77
Treasurer's disbursements for Hospital equipment	1,122 28
Balance carried to new account	156 17
	$140,203 16

In addition to the $156.17 balance in the treasury, on the first of July, 1877, there was received from the State Treasurer for interest, the sum of $13,410.01; and the further sum of $7,875.00 was also received from the State Treasurer on account of the 1-20 Mill Tax, making the sum total in the treasury $21,441.18.

At the same time (July 1st, 1877,) there was due for Salaries $17,856.25.

It will be observed that the sum of $29,647.41 was disbursed by the Treasurer during the fiscal year. The disbursements were made for the purposes named below.

For the Hospital	$1,625 74
For Insurance	2,388 50
For General Library	1,204 06
For Medical Library	790 81
For Law Library	540 65
For alterations and repairs	2,251 50
For fuel and light	5,290 14
For contingent expenses	5,870 88
For Regents expense account	168 50
For Museum	1,117 51
For Engineering Department	778 18
For Department of Physics	347 07
For improvement of grounds	548 00
For postage	527 66
For Chemical Laboratory supplies	6,198 21
Total	$ 29,647 41

The estimated receipts for the fiscal year ending June 30th, 1878, are as follows:

Balance in the Treasury July 1, 1877, less amount due for services	$ 3,584 93
For interest on the University Fund	38,100 00
For Annual State Aid—Act of 1873—1-20 mill Tax	31,500 00
For Annual State Aid—Act of 1875–7, College of Homœopathy,	8,500 00

For State Aid—Act of 1875, School of Mines (balance)	4,000 00
For State Aid to pay salary of Professor of Geology, 1877	2,000 00
For State Aid for Physical Laboratory equipment, 1877	1,000 00
For State Aid to pay salary of Professor of Physics, 1877	2,000 00
For State Aid to pay current expenses of Hospital, 1877	2,000 00
For State Aid tor Physiological Laboratory equipment, 1877	2,500 00
For State Aid for General Library account, 1877	2,500 00
For State Aid to pay salaries of Professors in Dental College, 18	4,500 00
For State Aid for Apparatus for Dental College, 1877	1,000 00
For State Aid to repair building for Dental College, 1877	1,000 00
For State Aid for Astronomical Observatory, 1877	1,500 00
For State Aid to extend term of instruction in Medical Department, 1877	1,500 00
For Students' Fees and Diplomas	32,000 00
For Chemicals and Apparatus, Chemical Laboratory	6,000 00
For State Aid—current expenses of Hospital	2,000 00
Total	$150,184 93

The disbursements for the same time are estimated as follows:

For salaries of Officers, Professors and Employes in all departments of the University	$ 90,000 00
For repairs and alterations	2,500 00
For Fuel and Light	5,200 00
For Insurance	2,500 00
For Law Library	500 00
For Medical Library	500 00
For General Library—including State aid	2,500 00
For Annual Calendar and printing Reports of Proceedings	1,500 00
For improvements of Grounds	500 00
For Postage	500 00
For Regents' expenses	800 00
For Museum and Microscopical room	1,000 00
For Physics and Engineering Departments, each $500	1,000 00
For Hospital—including State aid for 1877	2,500 00
For College of Homœopathy—current expenses	1,000 00
For Dental College—including State aid for Apparatus	1,500 00
For Dental College—including State aid, repairs on building	1,000 00
For Physical Laboratory equipment—State aid	1,000 00
For Physiological Laboratory—State aid	2,500 00
For Astronomical Observatory—State aid	1,500 00

For Contingent expenses	5,000 00
For Chemical Laboratory—current expenses	6,000 00
For outstanding warrants	17,000 00
Total	$148,000 00

The annual report of the Treasurer, with a full list of all the warrants paid by him is herewith submitted. This list of warrants has been carefully compared with the books of the Secretary and found to be correct.

Your committee submit herewith a list of all the officers, professors aud employes of the University, showing the amount of salary paid each.

The year opens more favorably, financially, than was anticipated at our last meeting. There has been a gratifying increase in the amount received from students' fees. But your committee are reminded that we have an indebtedness which must be liquidated. With the reduction in expenses, made at our last meeting, and the increase in fees, we think this indebtedness may be nearly wiped out during the coming year; but this can only be accomplished by a strict adherence to the policy adopted at our last meeting.

C. B. GRANT,
S. S. WALKER,
E. C. WALKER.
Committee

October 11, 1877.

APPENDIX B.

[No. 185.]

AN ACT entitled "an act making appropriations for the general and other expenses of the University of Michigan."

SECTION 1. *The People of the State of Michigan enact*, That there shall be and is hereby appropriated out of the State treasury, for the general expenses of the University of Michigan and for other expenses herein named, the following sums, to wit: To pay the professor of geology for the year eighteen hundred and seventy-seven, two thousand dollars; to pay the professor of geology for the year eighteen hundred and seventy-eight, two thousand dollars; for the physical laboratory for the year eighteen hundred and seventy-seven, one thousand dollars; for the physical laboratory for the year eighteen hundred and seventy-eight, five hundred dollars; to pay the professor of physics for the year eighteen hundred and seventy-seven, two thousand dollars; to pay the professor physics for the year eighteen hundred and seventy-eight, two thousand dollars; for the hospital for the year eighteen hundred and seventy-seven, two thousand dollars; for the hospital for the year eighteen hundred and seventy-eight, two thousand dollars; for the physiological laboratory of the medical departments for the year eighteen hundred and seventy-seven, two thousand five hundred dollars; for the physiological laboratory of the medical departments for the year eighteen hundred and seventy-eight, one thousand dollars; for the general library for the year eighteen hundred and seventy-seven, two thousand five hundred dollars; for the general library for the year eighteen hundred and seventy-eight, two thousand five hundred dollars; to pay the professors in the dental school for the year eighteen hundred and seventy-seven, four thousand five hundred dollars; to pay the professors in the dental school for the year eighteen hundred and seventy-eight, four thousand five hundred dollars; to pay for apparatus in the dental school for the year eighteen hundred and seventy-seven, one thousand dollars; to pay for apparatus in the dental school for the year eighteen hundred and seventy-eight, five hundred dollars; to repair a building for the dental school for the year eighteen hundred and seventy-seven, one thousand dollars; for the astronomical department for the year eighteen hundred and seventy-seven, one thousand five hundred dollars; to enable the regents to extend the term of instruction in the department of medicine and surgery to nine months for the year eighteen hundred and seventy-seven, four thousand five hundred dollars; to enable the regents to extend the term of instruction in the department of medicine and surgery to nine monihs, for the year eighteen hundred and seventy-eight, four thousand five hundred dollars; to enable the regents to extend the term of instruction in the homœopathic college to nine months, for the year eighteen hundred and seventy-seven, two thousand five hundred dollars; to enable the regents to extend the term of instruction in the homœopathic college to nine months, for the year eighteen hundred and seventy-eight, two thousand five hundred dollars.

SEC. 2. There shall be assessed upon the taxable property of the State in the year eighteen hundred and seventy-seven, the sum of twenty-seven thousand dollars, and in the year eighteen hundred and seventy-eight, the further sum of twenty-two thousand dollars assessed and levied in like manner as other State taxes are by law levied, assessed, and paid; which tax when collected shall be credited np to the general fund to reimburse the same for the amounts drawn therefrom, as provided in section one of this act.

SEC. 3. This act shall take immediate effect.

Approved May 22, 1877.

UNIVERSITY OF MICHIGAN.

THE

PRESIDENT'S REPORT

TO THE

BOARD OF REGENTS

FOR

THE YEAR ENDING JUNE 30, 1878.

ANN ARBOR:
PUBLISHED BY THE UNIVERSITY.
1878.

ANN ARBOR PRINTING AND PUBLISHING COMPANY.

PRESIDENT'S REPORT.

To the Honorable Board of Regents:

I have the honor to present to you my Report for the University year ending June 30, 1878.

The changes in the Faculties have been fewer than usual. In June, 1877, W. J. Hawkes, M. D., was appointed Professor of the Theory and Practice of Medicine in the Homœopathic Medical College. October 8th he resigned his place. Acting under instructions from the Board, the Committee on the Homœopathic College on October 22d invited Charles Gatchell, M. D. to the chair vacated by Dr. Hawkes. Dr. Gatchell accepted and entered on his duties on the 29th of October. His appointment was formally confirmed by the Board at the January meeting. At the same meeting Assistant Professor Pattengill was granted leave of absence until the beginning of the next College Year, with permission to apply prior to the June meeting for a further extension of his leave. Elisha Jones, M. A., was appointed Acting Assistant Professor of Greek for the period of Professor Pattengill's absence. The title of Mr. Spalding was changed from that of Instructor in Zoölogy and Botany to Instructor in Biology and Botany. In June, 1878, as the term of Dr. J. G. Gilchrist's Lectureship on Surgery in the Homœopathic Medical College then expired, E. C. Franklin, M. D., was appointed Professor of Surgery in that College. He was also appointed by the Board Dean of the Homœopathic Medical Faculty. The title of Dr. S. A. Jones was changed from Professor of Materia Medica and Therapeutics to Professor of Materia Medica, Therapeutics and Experimental Pathogenesy in the Homœopathic Medical College. Charles N. Jones, B. A., Instructor in Mathematics, who had been absent on leave for a year, was elected Assistant Professor of Mathematics.

During the year degrees were conferred as follows:

Mining Engineer	4
Civil Engineer	16
Bachelor of Science	5
Bachelor of Philosophy	9
Bachelor of Arts	41
Master of Philosophy	1
Master of Arts	2
Doctor of Philosophy	1
Doctor of Medicine (Department of Medicine and Surgery)	98
Bachelor of Laws	148
Pharmaceutical Chemist	22
Doctor of Medicine (Homœopathic Medical College)	22
Doctor of Dental Surgery	14
Doctor of Laws (Honorary)	1
Total	383

It will be borne in mind that no degrees, save those which are announced as honorary, are now conferred except upon examination.

The attendance of students last year was as follows:

DEPARTMENT OF LITERATURE, SCIENCE AND THE ARTS.

Resident Graduates	7	
Seniors	65	
Juniors	49	
Sophomores	77	
Freshmen	147	
In Selected Studies	22	367

DEPARTMENT OF PHARMACY.

Second Year	25	
First Year	44	69

The Polytechnic School contains from the above Departments 127.

DEPARTMENT OF MEDICINE AND SURGERY.

Students—Total in the Department		297

DEPARTMENT OF LAW.

Seniors	155	
Juniors	229	384

HOMŒOPATHIC MEDICAL COLLEGE.

Students—Total	73

COLLEGE OF DENTAL SURGERY.

Students—Total	43
Total in the University	1233

The total number in the University was greater by 123 than in 1876–7. In the Department of Literature. Science and the Arts the total number was less by 2 than in the previous year. This slight shrinkage is due to the falling off in the number of Resident Graduates from 14 to 7. The undergraduates were more numerous by 5. In the School of Pharmacy the gain was 5, in the Law School 75. in the Department of Medicine and Surgery 12. in the Homœopathic Medical College 22, in the Dental College 10. This increase of numbers in the days of financial stringency was as unexpected as it was gratifying. Owing to the lengthening of the medical term from six months to nine months we had expected a falling off rather than an increase in attendance on the Medical Schools.

In the Department of Literature, Science and the Arts the attendance of undergraduates by courses was as follows: Mining Engineer, 13; Scientific, 20; Civil Engineer, 39; Latin and Scientific, 71; Classical, 195; Select, 22.

The number of women in the University was 93, or about seven and a half per cent of the whole. The percentage heretofore has been about nine. They were distributed as follows: In Literary Department, 51; School of Pharmacy, 1; Department of Medicine and Surgery, 25; Law School, 1; Homœopathic Medical College, 15.

A little more than 49 per cent. of the students were from Michigan. In the Literary Department 68 per cent. were from Michigan; in the aggregate attendance in the Medical Schools and Dental School, 49 per cent.; in the Law School about 34 per cent.; in the Pharmacy School, 50 per cent. Illinois and Ohio each sent us 98 students; New York 89; Pennsylvania, 59; Indiana, 60; Wisconsin, 32; Canada, 24; Minnesota, 25; Missouri, 22; Kansas, 19; California, 10; Kentucky, 8. Every New England State was represented here, Massachusetts sending the largest number, 10. We had students from Armenia (Asia), Japan, Russia, Porto Rico, and the Hawaiian Islands. Thirty-four of our own States and Territories, and five foreign lands were thus represented in the body of students. These simple figures indicate how wide is the influence of the University.

In the Department of Literature, Science and the Arts the year's work has been on the whole exceedingly satisfactory. The reduction of the teaching force has made it difficult to render the best aid to our large classes in some branches, especially in Mathematics. But by the industry of our Faculty all that was possible was accomplished, and the provision for the next year relieves us of the embarrassment we have experienced in caring for the classes in Mathematics. We do, however, greatly need still one more teacher in the Modern Languages. Never have our students devoted themselves to their duties in a more orderly, earnest and commendable spirit than during the past year. There has not been a single case of serious discipline.

The desire which we have long cherished to open a Laboratory for special instruction in Physics has this year been gratified. The Legislative appropriation of fifteen hundred dollars for apparatus and of a salary for a Professor enabled us to begin this much needed work with a good degree of success. It is to be hoped that we shall be able to add to our means of illustration, until we shall be as well furnished for teaching Physics as we are for teaching Chemistry.

The appropriation of fifteen hundred dollars made by the last Legislature for the purchase of astronomical instruments has enabled us to erect a small observatory near the large one. The Director has secured an equatorial telescope of six inches aperture, and a transit instrument with zenith-telescope attachment, so mounted as to be used either in the meridian or in the prime vertical. These instruments can be used for instructing students, while the large telescope and the meridian circle will be used by the Professor in his observations. The transit of Mercury on May 8th was successfully observed by Professor Watson.

The necessary expenses were met chiefly by an appropriation by Congress, but partly by a small appropriation by the Board.

It is proper to add that at the recent total eclipse of the sun Professor Watson has discovered two new planets between Mercury and the sun. He had been a firm believer in the theory advanced by the French Astronomer, Leverrier, of the existence of an intra-Mercurial planet, to which, in anticipation of its discovery, the name of Vulcan had been given. In his search he not only found Vulcan, but also another planet. This is by far the most brilliant of the many achievements by which Professor Watson has won renown, not only for himself, but for the University. It has awakened the deepest interest on both sides of the Atlantic.

I cannot but take this occasion to renew my expression of the desire that either by private or by public munificence some adequate provision should be made for a publication fund to enable the Director to print the results of his work at our Observatory.

The Faculty of the Literary Department, ever watchful for the good of the University, have repeatedly during the last few years made such changes in the requirements for admission to the courses of study and in the methods of teaching as seemed to them to promise an increase of the usefulness of the Institution. Indeed from the beginning of the life of this University its authorities have been distinguished for the boldness and originality of their policy. They have had the pleasure of seeing not a few of their innovations, which were at first criticised, adopted by many of the leading colleges of the land. They have aimed, not so much to follow blindly the traditionary course of older colleges, as to seek with wisdom to make this Institution accomplish most successfully the largest and best work possible for it with its resources. Animated by this spirit the Faculty have for several months past been diligently inquiring whether some important and useful changes could not be made in our plans. The happy results, which had followed from opening elective studies to the senior class, impressed them with the belief that some liberty of choice might properly be extended to all the students. Again they had long felt that while the University courses were co-ordinate with most of the courses in certain prominent high schools, still the so-called English course, which is prolonged and thorough, in many schools covering the same period of study as the preparatory classical course, had no natural sequel here, which led to any degree. The question was forced on them whether while this was the case, the University was doing all that it ought to do in discharging its duty as an integral part of the State system of public education. Ought it not to try without sacrificing the interests of good scholarship and sound culture, to bring itself into some harmonious and useful relation with that large number of High Schools which provide no classical course, but do provide a thorough English course of education which may form a suitable preparation for some scholarly course of training here? It seemed to the Faculty that an honest effort should be made to accomplish that end. Therefore they requested this Board to establish a new course, for which the thorough English course as given in our best High Schools should form the preparation, and to confer the degree of Bachelor of Letters on those who should complete the proposed course. The required work in this new course is largely in the English, French and German Languages and Literatures and in History.

Again, the Faculty were of the opinion that undue importance had been given to the element of time in fixing the requirements for graduation. In every class there are some persons who can easily do much more work than the majority of the class, and who, if permitted, could complete the studies required for graduation in less time than their less gifted associates. Since the work for a class must be so set that the pupils of average talent can perform it fairly, the best men do not under ordinary collegiate arrangements have the highest stimulus presented to them to do their best work. Indeed, when no electives are offered they are often kept back in order to accompany the class. It is true they may spend their leisure in reading. But ought not the collegiate system to be made flexible enough to furnish all needed opportunities for these exceptional students to use their best energies in some regular work? It has seemed to the Faculty that by taking proper precautions to prevent mere cramming, by requiring of each student the use of so much time as is needful for him to digest and assimilate his intellectual nutriment, they may wisely allow every one to do as much work as he can do well, and may recommend him for his degree whenever he has completed the work required for it. It will be possible for the most gifted students to obtain the first degree in a little less time than four years, and the second degree in a little less than five years, or if they choose to remain the full time, which is better, they can broaden and enrich their course by the election of studies not required for their graduation. It seems probable that while this will stimulate each one to make the largest attainments possible for him, it will also lead an increased number to push on their studies to the attainment of the second degree.

Again, the Faculty have thought it wise to try the experiment of admitting to the privileges of the University, without passing the regular examinations for entrance, persons of some culture and of mature years who do not desire to graduate. We have with great caution received a few such during the years past. There are men and women, especially school teachers, who have had a good deal of intellectual training, perhaps at some time have been nearly or quite prepared for college, but have been prevented from taking a college course, who greatly desire to pursue certain special studies, which they are thoroughly prepared to pursue in a manner creditable to themselves and to the University. There seems to be no good reason why at least a limited number of such persons may not be admitted to the privileges of study here. The Faculty therefore decided to permit persons of not less than twenty-one years of age, who should give satisfactory evidence of their ability to pursue the studies which they wish to take, to enter our class-rooms and avail themselves of such help as we can offer them.

It is proper to say that in making the changes named, which some may deem rather bold experiments, the Faculty had constantly in mind the mature age and the earnest purpose of our undergraduate students. For a series of years the average age of our students on entering the Freshman class has been about nineteen and a half years. Consequently we may say the average age of our students is over twenty-one. Very few of them are unwillingly here. The mass of them have not come because they were sent. A large proportion of them have toiled hard to earn the means by which they are enabled to stay here. It is but simple justice to say that they are here with a manly purpose to make the best use they can of the opportunities afforded them. If any body of students can safely be entrusted with large liberty in the choice of their studies, our undergraduates can. The disposition, which is manifested in all the large colleges, to leave wider freedom in the election of studies, can nowhere be more prudently indulged than here.

It is highly probable that some of the details may call for modification in the actual working of the scheme. We are not so wedded to any theory, which underlies it, that we shall not be ready to alter, amend, or abolish, as shall seem wise on trial. But we believe that we shall increase in a marked degree both the usefulness and the popularity of the University. The proposed changes have been received with great enthusiasm by our students and have already brought us warm commendations from many quarters, both from within and from without the State.

These were the principal considerations which led to the modifications of our plan of work, which were announced in May last. The occasion was seized however to make a distribution of the work, which should be better both for students and for teachers. It was thought that the earlier part of our courses was too exclusively given to a few studies, that it tended thereby to become monotonous and wearisome. Opportunity is now afforded for diversifying the course by judicious elections of studies. In all the courses save the Engineering courses, it is possible for the student during every term to elect some study. Previously the work of some chairs of instruction was intolerably heavy in certain parts of the year and too light at other parts. The rearrangement of our work has enabled us to remedy this evil.

Since the Class Day of the Seniors has been brought into Tuesday of Commencement week, the Alumni have found themthemselves crowded for an opportunity for their meetings. The Board, justly deeming it of the first importance that the Alumni should have every facility they desire for their reunions, decided to try the experiment this year of giving up Wednesday to them and to fix Thursday as Commencement Day. The Alumni, in an appreciative spirit, made special efforts to render Alumni Day attractive. An unusually large number of graduates was present and the exercises were of marked interest. In the evening the University Senate, comprising all the Faculties, gave a reception in University Hall to the Alumni and other friends of the University. A large concourse was present. Commencement Day was marked by a noteworthy change. No speakers were appointed from the graduating class, but an oration was given by Hon. Geo. V. N. Lothrop, LL. D., of Detroit. It may be well to place on record here the principal reasons which have led us to abandon a mode of observing Commencement, which has been general, and I think, universal, in this country. In the first place, as we have no marking system, it was very difficult to make appointments, which were satisfactory either to the Faculty or to the class. When we had selected ten speakers, there were always some of their classmates who seemed equally as deserving as some of those who were appointed. Again, and perhaps partly because of this difficulty, for the last few years the opinion had been gaining ground among our students, until it had become very general, that it was not desirable to have members of the graduating class speak on Commencement Day. Some argued that such declamation was unknown in European Universities and that it was more appropriate to High Schools and Academies than to Colleges. From whatever cause there was great dislike among the students to the traditionary custom. In the third place, the lengthening of the Medical term to nine months and the prospect that possibly before long the other Professional Schools would extend their terms to nine months presented a new embarrassment. We must either have in addition to the Commencement of the Literary Department a separate Commencement for each of the principal schools, or we must have a University Commencement for the graduation of all who complete their courses in June. The latter alone was to be thought of. But if the Professional schools joined in the University Commencement, and the graduates of the Literary department were appointed to speak, why should not the graduates of the other schools also be appointed? Clearly graduates from all the schools must in that case be placed upon the stage to speak, or else none should be appointed, but some distinguished scholar or orator should be chosen to deliver a University oration at the University Commencement. After deliberation it was thought wisest to pursue the latter course, though it was not without reluctance that many saw the old usage given up. But any fears that the change would cause a diminution in the attendance or the interest on Commencement Day must have been dispelled by the result of our first experiment. We were fortunate in securing the services of so eminent an orator to introduce the new custom and we have reason to be especially grateful for his choice of a theme. No better use could be made of Commencement Day than to present so cogent, statesmanlike and eloquent an argument in favor of the support of Higher Education by the State.

The experiment of lengthening the term in the Medical schools from six months to nine months has now been thoroughly tried. We had anticipated a decline in the attendance. It was supposed that some students would be unwilling to incur the additional expense involved in prolonging their residence here three months, and that others would prefer for other reasons to attend schools which would graduate them on easier conditions than are imposed here. Probably some were diverted from us by such considerations. But on the other hand we have been much gratified to see that not a few students came here avowedly because the term was lengthened. This indicates an encouraging desire on the part of many in the medical profession to encourage the most thorough preparation, and on the part of those who are aspiring to enter the profession, to secure such preparation for themselves. The attendance in the Department of Medicine and Surgery was larger by eleven, and that in the Homeopathic College by twenty two, than it was in the previous year.

The Physiological Laboratory which the generosity of the last Legislature enabled us to establish, has been of great service to our medical students. More than two hundred and fifty of them have availed themselves of its advantages.

In the Law School there were seventy-five more students than in the previous year, the total attendance being three hundred and eighty-four. The seating capacity of the lecture room was taxed to the utmost. It is becoming a serious question how our increasing classes are to be accommodated. It is well known to you that the Faculty of the Law Department have for some time thought it highly desirable to add one instructor to their present force. At the meeting in October, 1877, this Board authorized the Faculty and the Committee on the Law Department to provide additional assistance for the last year. It did not prove practicable to act in accordance with this suggestion. But it is to be hoped that some arrangement like that then contemplated may yet be made.

It was expected that the general depression in business would make itself felt in the diminution of the attendance on the Pharmacy School. But the number of pupils was a little larger than during the previous year. The reputation of the school is now so firmly established that we may expect its prosperity to continue. Our chief solicitude arises from the difficulty of accommodating the students in the crowded condition of our Chemical Laboratory. Never before were so many pupils under instruction in a single year in the Laboratory. Although we have one hundred and seventy-five tables, not unfrequently during the past year it has been necessary to place two students at the same table.

The Dental School has a steady and healthy growth. Its work is regarded with much favor by the Dental Profession, and there can be no doubt that its classes will increase in numbers and the instruction become more and more efficient. It is to be hoped that the State will continue to supply it with the means necessary for its vigorous life.

The work at the medical clinics and at the Hospital is becoming ot increasing importance. It appears from the report of the Resident Physician of the Hospital that six hundred and nineteen patients were treated between October 1, 1877 and Aug. 31, 1878. Two hundred important operations were performed. There were thirty-three operations for cataract, and thirty of them were successful.

The Secretary of the Board of Control of the State Public School at Coldwater has shown the desirableness of making some provision here for the surgical care of dependent and needy children. This Board has expressed its willingness to render them the needed help if the State will furnish us the means. This suggests again the great advantage which would accrue to the State, if provision were made here for caring for the sick and disabled persons, who now crowd our county Alms-Houses. There is no doubt that many of them might be restored to lives of usefulness, if they could have proper medical and surgical attention. A large proportion of them have curable ailments of the eye. Our Medical Professors would attend upon these sick poor gratuitously, and it would probably cost the counties little more to support their invalid paupers at a Hospital here than it costs them now. There can be little question that it would be a measure of wise economy as well as of humanity for the State to establish a Hospital here for the relief of the inmates of county Poor Houses.

The appropriation of five thousand dollars voted by the Legislature for the purchase of books has enabled us to make a most valuable addition to our General Library. But we must still say that for the purposes of a University, where there is such a concourse of students, and where so many and so various kinds of intellectual work are done, our collection of books is far too small.

It is to be hoped that in some way we may be able to make adequate provision for the support of our School of Mines, including the School of Architectnre. It will be remembered that owing to the failure of the last Legislature to make an appropriation for that purpose, we were obliged to drop our instruction in Architecture. We were enabled without expense to the State to make temporary provision for the instruction in Mining. But we cannot continue the work on the present plan after this year. I am still of the opinion that the plan broached in the Legislature in 1877 to remove the school to the Upper Peninsula is unwise. If the students are permitted to do their principal work here, and can with their instructors visit the Upper Peninsula in the summer, the best results will be obtained in the most economical manner.

I venture to repeat a suggestion I have made in a previous report, that it would be of essential service to the cause of education in the State, if a course of lectures on Pedagogics could be given here by some competent man. A large proportion of our students engage in teaching after graduation. Some adequate exposition of the Science and the Art of Teaching, some methodical discussion of the organization and superintendence of schools, would be most helpful. Our new system would easily yield a place for such instruction. Perhaps for a time at least a non-resident lecturer occupying a part of a year, might meet the wants of our students, and might afford us an opportunity to test the value of such a course as is here suggested.

I cannot refrain from again reminding the friends of the University that we are in pressing need of two new buildings, one for the Library and another for the Museum of Science and Art and for lecture rooms to be used in connection with the Museum by the Professors of the Physical and the Biological Sciences. We expect to be patient and to bear with many inconveniences in these times of financial distress. But we may meantime call attention to the fact that we are suffering great inconvenience and exposing our Library and our rare and extensive scientific collections to the risks of destruction by fire for the lack of new fire-proof buildings.

With great pleasure I call attention to the Finance Committee's Report, which is hereto appended, and which shows that we closed our fiscal year with no indebtedness and with a handsome balance in the Treasury. It is a cause of great satisfaction that we have been able to liquidate the debt which had been for some time accumulating. There seems no reason to doubt that our receipts from students' fees will be materially larger this year than they were last year. The increase in the number of students which makes this result certain, also makes it in my judgment absolutely necessary that we have some addition to the Faculty of instruction in the Literary Department. We cannot maintain, and we do not deserve the favor of the public, if we undertake to give collegiate instruction to sections so large that each student cannot receive proper attention and assistance.

We must all feel encouraged by the appreciation which is shown in this State and in other States, of the work of the University. Colleges and professional schools are everywhere growing and improving; yet the number of students who resort to our halls steadily increases, and the influence and reputation of the University are constantly extending. If the State continues to us its cordial support and if we wisely administer the trust confided to us, still larger possibilities of usefulness are easily within reach of this Institution.

Respectfully submitted,

JAMES B. ANGELL.

APPENDIX.

REPORT OF THE FINANCE COMMITTEE.

The Finance Committee of the Board of Regents submit their annual report showing the financial operations of the University for the fiscal year ending June 30, 1878, with an estimate of the probable receipts and expenditures for the fiscal year ending June 30, 1879.

RECEIPTS—GENERAL FUND.

Balance in the Treasury July 1, 1877	$ 156 17	
Received from State Treas'r on acc't of int. fund	38,596 96	
Received from State Treas'r on acc't 1-20 mill tax	31,500 00	
Received from Steward for students' fees and laboratory deposits	47,335 00	
Received on account of temporary loans	15,000 00	
Received for interest on Treasurer's account	149 42	
Received from medical students in part payment Diploma plate	90 00	$132,827 55

RECEIPTS—SPECIAL FUND.

Received from State Treas'r, School of Mines acc't.	$ 4,000 00
Received from State Treas'r for Hom. Med. Col	6,000 00
Received from State Treas'r for Hospital expenses for 1877-78	4,000 00
Received from State Treas'r for Dent. College, salary account 1877	4,500 00
Received from State Treas'r Dent. Col., repairs	1,000 00
Received from State Treas'r, Dent. Col,, apparatus, 1877	1,000 00
Received from State Treas'r, General Lib., 1877-8	5,000 00
Received from State Treas'r, Physiol. Lab , 1877	2,500 00
Received from State Treas'r, Physical Lab., 1877-8	1,500 00
Received from State Treas'r, Astron. Obs., 1877	1,500 00
Received from State Treas'r, Professor of Geology, salary, 1877	2,000 00

Received from State Treas'r, Professor of Physics, salary, 1877	2,000 00	
Received from State Treas'r, for extended term in Medical College, 1877	4,500 00	
Received from State Treas'r, for extended term in Homœopathic Medical College, 1877	2,500 00	$42,000 00
Total receipts		$174,827 55

DISBURSEMENTS—GENERAL FUND.

Paid salaries of Officers, Professors, and other employees of the University	$71,018 20	
Paid temporary loans	32,000 00	
Paid interest on temporary loans	755 62	
Treasurer's disbursements as per vouchers sub'm'd	30,002 98	$133,776 80

DISBURSEMENTS—SPECIAL FUND.

Paid salaries of Professors and other employees as follows;		
For the Homœopathic Medical College	$ 3,561 08	
For College of Dental Surgery	4,300 00	
For School of Mines	3,266 80	
For Professor of Geology	1,000 00	
For Professor of Physics	900 00	
For Professor in Physiological Laboratory	375 00	
For extended term Dept. Medicine and Surgery	2,250 00	
Treasurer's disbursements from special funds as per vouchers submitted herewith:		
For Homœopathic Medical College	$ 1,141 45	
For College of Dental Surgery	603 29	
For Dental College Repairs (in full)	1,000 00	
For Dental College apparatus	972 36	
For General Library	4,112 08	
For Physiological Laboratory	1,845 09	
For Physical Laboratory	1,377 84	
Astronomical Observatory	996 22	
For new Hospital Equipment	496 58	
For Hospital	2,741 07	$30,938 86
Balance carried to new account		10,111 89
		$174,827 55

It will be observed that the Treasurer's disbursements from the General fund during the year were $30,002 98. The following detailed statement shows for what purposes the disbursements were made:

For Alterations and repairs	$ 2,595 17
For Fuel and lights	5,448 59

For Improvement of grounds	466 42	
For Insurance	2,046 90	
For Chemical Laboratory supplies	5,563 28	
For Annual Calendar for 1877-8	1,075 60	
For General Library	482 42	
For Law Library, including amount paid for adv.	669 25	
For Medical Library, including amt. paid for adv.	714 87	
For Museum	571 38	
For Postage	356 24	
For Engineering Department	149 70	
For Contingent Expenses	9,857 16	—$30,002 98

[It is proper to say that the following bills have been paid from the Contingent Fund; but in the estimate made in July, 1877, of probable expense on account of that fund, no items of this class were included. This will explain the discrepancy between the estimated and the actual contingent expenses. The following are the bills referred to, and are included in the above item of $9,857.16, designated "contingent expenses."]

Paid R. Tregaskis, balance as Accountant	$ 108 00	
Paid for printing testimony, Rose-Douglas suit	293 09	
Paid Alpheus Felch, professional services	125 00	
Paid C. I. Walker, professional services	210 60	
Paid I. P. Christiancy, professional services	924 69	
Paid W. L. Webber, professional services	898 70	
Paid Peter Tuite, Clerk of the Circuit Court	43 00	
Paid G. S. Wormer & Son, for steam pump at Lab.	200 00	
Paid on special appropriation, Dr. Frothingham	47 10	
Paid on special app., steam coil Med. College	44 59	
Paid B. F. Sturtevant, blower for Chem. Lab.	65 00	
Paid First National Bank of Ann Arbor for interest on temporary loans	755 62	
Paid for Annual Calendar for 1876-7	1,196 04	
Paid special appropriation for Prof. Watson	200 00	—$ 5,111 43

All other items of the Treasurer's contingent expense account might be given, but it is not deemed necessary, as all of the vouchers are herewith submitted, and will remain on file.

It will be seen on examination that the aggregate amount of receipts covered into the General Fund, during the year was $132,827.55, and that the amount paid out on account of that fund was $133,776.80, which shows the Fund to have been overdrawn $949.25.

The amount received from the State Treasurer on account of special appropriations made by the State Legislature during the fiscal year was $42,000.00. The amount paid out during the year on account of these special funds was $30,938.86, showing a balance in the treasury to the credit of the Special Funds of $11,061.14. If we deduct from the aggregate Special Funds balance the amount of the General Fund overdraft, viz: $949.25, the balance in the treasury will appear as above stated, 10,111.89.

Under an act entitled "An act making appropriations for the general and other expenses of the University of Michigan," approved May 22, 1877, there was appropriated for the year 1877, the sum of $27,000, and for the year 1878 the further sum of $22,000=$49,000. Of this amount $32,000 had been drawn on the requisitions of the Treasurer before the close of the last fiscal year, leaving a balance of $17,000, subject to draft by that officer, a part of which has been drawn by him as will appear in his quarterly statement submitted to the Board at this meeting.

The objects for which the balance of the appropriations were made are as follows:

For extending the term of instruction in the Department of Medicine and Surgery for 1878.....	$ 4,500 00	
For extending term in Homœopathic Med. College same time..	2,500 00	
For payment of salaries in College of Dental Surgery, 1878..	4,500 00	
For payment of salary of Prof. of Geology, 1878...	2,000 00	
For payment of salary of Prof. of Physics, 1878.....	2,000 00	
For apparatus in the Physiological Laboratory.....	1,000 00	
For apparatus in the College of Dental Surgery...	500 00	—$17,000 00

The estimated receipts for the fiscal year ending June 30, 1879, are as follows:

Balance in the Treasury June 30, 1878........................	$10,111 89	
For interest on the University Fund....................	38,200 00	
For Annual State Aid, Act of 1873, 1.20 mill tax...	31,500 00	
For students fees, Lab. receipts and Diploma fees..	46,000 00	
For Annual State Aid, Act of 1875, Hom. Med. Col.	6,000 00	
State Aid—Act of 1877—		
To pay salary of Professor of Geology............	2,000 00	
To pay salary of Professor of Physics............	2,000 00	
For Dental apparatus	500 00	
For Physiological Laboratory.........................	1,000 00	
For salaries of Professors in Dental College...	4,500 00	
To extend term in Medical Department..........	4,500 00	
To extend term in Hom. Med. College...........	2,500 00	–$148,811 89

The estimated disbursements for the same time are as follows:

For salaries of Officers, Professors, and Employees in all departments of the University..............	$86,500 00
For Alterations and Repairs................................	3,000 00

For Fuel and Light	5,400 00	
For Insurance	2,500 00	
For General Library	2,000 00	
For Medical Library	500 00	
For Law Library	500 00	
For Annual Calendar	1,100 00	
For Postage	600 00	
For Improvement of Grounds	500 00	
For Museum and Microscopic room	1,000 00	
For Engineering Department	500 00	
For Department of Physics	500 00	
For Apparatus for Dental College	500 00	
For Current Expenses of Dental College	600 00	
For Chemical Laboratory supplies	6,000 00	
For Apparatus for Physiological Laboratory	1,000 00	
For current Expenses Hom. Med. College	1,200 00	
For Publication of a General Catalogue	500 00	
For advertising Department of Med. and Surgery	200 00	
For advertising Department of Law	200 00	
For adverfising Department of Lit., Sci. and Arts	200 00	
For advertising Hom. Med. College	200 00	
For advertising College of Dental Surgery	200 00	
For Regents' Expenses	800 00	
For Contingent Expenses	6,000 00	
For Department of General Chemistry	500 00	—$122,500 00

The annual report of the Treasurer with a full list of the warrants drawn by the Secretary and countersigned by the President, is herewith submitted. The list of warrants has been carefully compared with the books of the Secretary and found to be correct. The vouchers of the Treasurer for bills paid, have also been examined and compared with his books, and found to agree. The annual report of the Treasurer herewith submitted is a transcript of his books.

The Steward's statement of the amount received for students' fees, Laboratory deposits and receipts, and for Diploma fees, has been examined, compared with his books and found correctly stated.

It will be remembered by the Board that at the beginning of the last fiscal year, the indebtedness of the University was $17,000. During the year that amount was unavoidably increased to $32,000. In consequence of the generous appropriations made by the last Legislature of the State and of the large increase of the amount received from students' fees, and because also of the rigid economy practiced in all of the expenditures of the University, your Committee are now able to announce that *the entire indebtedness of the University is cancelled.* It gives us great pleasure to make this statement, and also to add that with a proper regard to economy, we may hope to meet the most pressing wants of the University for the present, without again incurring debt.

Respectfully submitted.

ANDREW CLIMIE,
Chairman Finance Committee.
GEORGE L. MALTZ.

The above report is fully concurred in with the exception that the undersigned has not personally examined the warrants and accounts herein referred to.

SAMUEL S. WALKER.

UNIVERSITY OF MICHIGAN.

THE PRESIDENT'S REPORT

TO THE

BOARD OF REGENTS

FOR THE YEAR ENDING JUNE 30, 1879.

ANN ARBOR:
PUBLISHED BY THE UNIVERSITY.
1879.

ANN ARBOR PRINTING AND PUBLISHING COMPANY.

PRESIDENT'S ANNUAL REPORT.

To the Honorable Board of Regents:

I beg leave to present to you my Annual Report for the University Year, ending June 30, 1879.

The changes in the Faculties have been as follows:

October 11, 1878, Byron W. Cheever, M. A., was appointed Assistant in the Chemical Laboratory, in the place of Samuel T. Douglas, Ph. B., resigned. J. M. Schaeberle, C. E., was appointed Assistant in the Astronomical Observatory. Calvin Thomas, M. A., was appointed Instructor in Modern Languages and History. February 7, 1879, P. B Rose, M. D., was appointed Assistant Professor of Physiological Chemistry, and in June the title was changed so as to read Assistant Professor of Physiological Chemistry and Toxicology, and Lecturer on Renal Diseases. February 7, 1879, James C. Watson, Ph. D., LL. D., resigned his offices of Professor of Astronomy and Director of the Observatory, and on March 25th, Mark W. Harrington, M. A., was elected as his successor.

In June, 1879, the following promotions and appointments were made: Joseph B. Steere, Ph. D. promoted from the Assistant Professorship to the Professorship of Zoology; Alexander Winchell, LL. D., Professor of Historic Geology and Paleontology; William H. Pettee, M. A., heretofore Professor of Geology, in charge of Mining Engineering, now appointed Professor of Mineralogy and Economic Geology; Henry F. Lyster, M. A., M. D., Lecturer on Pathology and Practice of Medicine for one year; William H. Payne, M. A., Professor of the Science and the Art of Teaching; Professor Edward L. Walter, Ph. D., heretofore Assistant Professor of Latin, now appointed Professor of Modern Languages in place of George

S. Morris, M. A., resigned; Elisha Jones, M. A., Assistant Professor of Latin; Isaac N. Demmon, M. A., heretofore Assistant Professor of Rhetoric and History, Assistant Professor of Rhetoric and Anglo Saxon; Rev. Richard Hudson, M. A., Assistant Professor of History; Volney M. Spalding, M. A., promoted from Instructor in Botany to Assistant Professor of Botany; William J. Herdman, M. A., M. D., Demonstrator of Anatomy, was appointed also Lecturer on Pathological Anatomy; Charles H. Stowell, M. D., Instructor in the Physiological Laboratory, was appointed Lecturer on Physiology and Histology; Victor C. Vaughan, Ph. D., M. D., Assistant in Chemical Laboratory, was appointed also Lecturer on Medical Chemistry; Alfred Hennequin, M. A., Instructor in Modern Languages, who has been absent on leave, was recalled to duty.

In the resignation of Professor Morris and of Professor Watson, the University sustains a severe loss. Professor Morris has filled the Chair of Modern Languages for nine years and has brought to his work the resources of a most varied, profound and elegant scholarship. Dr. Watson has been connected with the Faculty since the very year of his graduation, 1857. For two years he was Instructor in Mathematics, and for twenty years he has had charge of the Observatory and filled the Chair of Astronomy. During that period he has discovered no less than twenty-seven minor planets and two comets, and has made the Observatory known throughout the world. The best wishes of the University will follow these two distinguished scholars to their new fields of labor.

The degrees conferred during the year on examination were as follows:

Pharmaceutical Chemist	25
Mining Engineer	3
Civil Engineer	6
Bachelor of Science	5
Bachelor of Philosophy	11
Bachelor of Arts	35
Master of Science	1
Master of Philosophy	1

Master of Arts	8
Doctor of Philosophy	1
Doctor of Medicine (Dept. of Medicine and Surgery)	104
Bachelor of Law	193
Doctor of Medicine (Homœopathic Med. College)	25
Doctor of Dental Surgery	15
Total	433

In addition to these, four honorary degrees were conferred, viz.: Civil Engineer, 1; Master of Arts, 1; Doctor of Laws, 2. The total number of degrees conferred during the year was therefore 437. In three cases two degrees were given on examination to the same person. The total number of recipients of degrees was 434. In no previous year has so large a number been graduated from the University.

The number of students in attendance was as follows:

Department of Literature, Science and the Arts.

RESIDENT GRADUATES	12
FOURTH YEAR	49
THIRD YEAR	67
SECOND YEAR	95
FIRST YEAR	172
SELECT	50
Total	445

Department of Medicine and Surgery.

STUDENTS.—Total in the Department		329

Department of Law.

SENIORS	195	
JUNIORS	211	
		406

School of Pharmacy.

SECOND YEAR	28	
FIRST YEAR	43	
		71

Homœopathic Medical College.

STUDENTS.—Total in the College		63

College of Dental Surgery.

STUDENTS.—Total in College		62
Total in the University		1376

The number in the University was greater by 143 or by more than 11 per cent. than in 1877-78, and greater by 266 or by 24 per cent. than in 1876, and greater than ever before in the history of the institution. There was an increase in every Department except in the Homœpathic Medical College. In the College of Dental Surgery the gain was 19; in the School of Pharmacy, 2; in the Law School, 18; in the Department of Medicine and Surgery, 22; in the Literary Department, 78.

In view of the second year's trial of the extension of the medical term from six months to nine months, the increase in the attendance in the Department of Medicine and Surgery was very gratifying. There seems now to be satisfactory evidence of a desire for a more extended and thorough medical education than has hitherto been furnished by the medical schools of this country.

Not less gratifying was the enlarged attendance in the Department of Literature, Science and the Arts. For years this central Department of the University had remained almost stationary in the size of its classes, while the other Departments were pretty steadily growing. This fact was one of the causes, which led the Faculty to resolve on the important changes which they made in the organization of its work a year ago. It was feared that in some way we were not meeting the real needs of the State and of the West as fully as we might. So far as numbers indicate, we have certainly good reason to be satisfied with the response which has been made to our proposition to make our instruction more attractive and useful. The number of students in the Literary Department is increased by about *twenty per cent.*

Of the undergraduates the number of candidates for the several degrees was as follows, viz.: Mining Engineer, 10; Civil Engineer, 25: Bachelor of Letters, 15; Bachelor of Science, 30; Bachelor of Letters (Latin), 92; Bachelor of Arts, 211. The number of Select Students was 50. Of these Select Students a considerable proportion were, as we had hoped they would be, teachers of mature years, who availed themselves of our offer to receive persons over twenty-one years of age without the regular examination, provided they should give evidence of their ability to pursue the work they should elect. Most of them desired to take some work as a specialty, and they proved almost without exception to be capable of carrying on their studies in a creditable manner, and were in no respect a source of embarrassment to our regular work.

The number of women in attendance was as follows: Department of Literature, Science and the Arts, 76; Department of Medicine and Surgery, 42; Law Department, 2; Homœopathic Medical college, 12; School of Pharmacy, 1; Dental College 1; total, 134. That is an increase over the previous year of 41. It will be seen that the women form a little less than ten per cent of all the students. That is a slightly larger percentage than we ever had before.

Of the women in the Literary Department the candidates for the various degrees were as follows: Bachelor of Letters, 5; Bachelor of Science, 4: Mining Engineer, 1; Bachelor of Letters (Latin), 19; Bachelor of arts, 30. There was one Resident Graduate, and there were 17 Select Students, several of whom had been teachers.

After our nine years' experience in co-education, we have become so accustomed to see women take up any kind of University work, carry it on successfully, graduate in good health, cause no embarrassment in the administration of the Institution, and awaken no special solicitude in the minds of their friends or of their teachers, that many of the theoretical discussions of co-education by those who have not had opportunities to examine it carefully read strangely to us here on the ground. It is a cause of sincere congratulation, that both in this country and in Europe, the opportunities for women to obtain as thorough and extended an education as men, are rapidly multiplying.

Michigan furnished this year, as last, about 49 per cent. of the students. In the Literary Department, 66½ per cent. were from Michigan; in the aggregate attendance in the Medical Schools and the Dental School, 44½ per cent; in the Law

School, 32½ per cent; in the Pharmacy School, 46½ per cent. Of the total increase of 143 students last year, 55 were from Michigan and 88 from other States. It would seem, therefore, that while we are attracting more Michigan students than formerly, we are even more rapidly strengthening our hold upon other parts of the Union.

Exception has sometimes been taken in our own State to our opening our doors on so easy terms to students from other States. It should be remembered in the first place, that a discrimination against students from abroad is made in our fees. A Michigan student pays only ten dollars admission fee, and an annual fee of twenty dollars. A student from another State, pays twenty-five dollars admission fee, and twenty-five dollars annual fee. In the second place, in the professional schools, where by far the larger proportion of students from abroad are found, the cost of instruction is only slightly increased by the admission of them, so that the sum received from them may be reckoned as almost a clear gain to our resources. For instance, in the Department of Medicine and Surgery during the past year the fees from Michigan students were only $4,140, while the fees from non-resident students were $7,675. The same corps of instructors would be required to lecture to the Michigan students alone as were required to teach the whole class. In the Law School the figures are yet more striking. The cost of instruction in that school was $6,400. Now the receipts from non-resident students were $12,000, that is, $5,600 more than the salaries of all the Professors, while the fees from Michigan students in that school were only $3,960. In passing I may direct attention to the fact that the total receipts of the Law School are nearly ten thousand dollars more than the expenses. But the main point which I wish now to make clear is, that in an economical point of view, it is wise neither to exclude non-resident students from the University, nor to charge them so high fees as to make a material diminution of their numbers.

In the Department of Literature, Science and the Arts, we have suffered no little embarrassment from having an inadequate number of teachers to instruct our greatly increased number of students. In order to extricate ourselves from debt, we have reduced our force of teachers to the smallest number, with which we could with tolerable efficiency care for the usual number of pupils. When at the beginning of the last year we were suddenly called on to provide instruction for about eighty more students than before, we found it impossible to do all we could have wished. We were compelled to have larger sections than we deemed it wise to have. Professors of one branch were obliged to teach other branches, and both students and teachers were subjected to inconveniences, from which fortunately we are now relieved.

It will, therefore, be seen that we were obliged to begin under serious disadvantages the new plan of work, which was discussed in my last Report. We were unable to enlarge the scope of our work as much as we had hoped. It was necessary to curtail to some extent the election of studies, which had been offered to all. But the students appreciated our situation and cheerfully acquiesced in the modifications of our scheme, which we were obliged to make. But in its essential features the new plan was fairly tried, and although a trial of one year is too brief to justify unqualified statements of opinion upon the experiment, I think I may truly say that we see no good reason to doubt that our expectations from it are to be realized. We have seen no disposition in our students under an elective system to choose studies, because they are easy, or to avoid those which are usually thought difficult. The tabular statement of the studies pursued will show this in convincing form.* The fears of those who had supposed that Greek might be dropped were allayed in observing that the number of persons studying Greek was never before so great. I am inclined to think that we are relieved from the peril of the choice of an undue proportion of easy studies by our having no marking system. When pupils are studying for class rank, they will be tempted to elect branches in which they can secure high standing. But that inducement is not offered here. As a rule, the elections were judiciously made.

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*See Appendix C.

We have noticed scarcely any inclination to take too little work. The mistakes have been, as we anticipated, quite in the other direction. Many pupils have desired to take more studies than they could pursue with the most profit. In numerous cases the Faculty have thought it wise to reduce the work, which students have marked out for themselves. During the first semester it became apparent to many of the students that they had elected too many studies, and in the second semester there was a manifest reduction in the amount of work undertaken. The year's experience has taught most of the undergraduates themselves what they can wisely attempt. The Faculty are determined to use all vigilance to prevent mere cramming. While they propose to allow every one to do all he can do well, they mean to insist that each student shall take time enough to digest and assimilate his intellectual food. To much cannot be said of the enthusiastic, hearty and manly spirit, in which the undergraduates as a body have received the new plan and have performed their duties. The utmost good order has prevailed. Not a case has occurred, which has called for serious discipline. The details of our work are more fully given in the Reports, which the Professors at my request have made, and which are found in the Appendix. (B.)

With the additions which have been made to our force of teachers, we shall be able to enlarge the range and improve the quality of our instruction the coming year.

An important step has been taken in establishing a Professorship of the Science and the Art of Teaching. I am not aware that there is a chair exclusively for this work in any other American college. In previous Reports I have directed attention to the necessity of providing here for some systematic instruction in Pedagogy. We annually send out a considerable number of students, who are to engage in teaching for some years, and not a few who intend to devote their lives to the work. Some of them are called at once to responsible position in our graded schools. It might greatly add to the value of their services to be familiar with the principles which should govern the administration of such schools, with the philosophy of teaching, and with the history of education. Our Professors have for several years given some special instruction in the methods of teaching the languages, mathematics and physics. But now in addition to their specific work a Professor is charged with the duty of giving systematic instruction in the general field, to which the name of Pedagogics is often applied.

We desire it to be most clearly understood that we have no intention of invading the territory of our neighbors of the Normal School. The line between their work and ours is very distinct. We wish simply to aid our undergraduates, who come here for collegiate study, to prepare themselves for the work of teaching, which they are certain to undertake, whether we have this new chair or not. If our effort to give specific instruction of this kind and of a high order is successful, it will tend to aid the Normal School by strengthening in the minds of our graduates and of the public the conviction that there is indeed a philosophy, a science, of education, which we are aiming to teach to such of our students as intend to become teachers, while the Normal School is also teaching it to every one of its hundreds of pupils in the manner most helpful to them. We earnestly desire to cooperate with and to aid in every proper way all the other educational institutions in the State. There is work enough and more then enough for us all to do. The prosperity of each conduces to the prosperity of all the rest.

I had occasion last year to express gratification that the extension of our Medical term from six months to nine months did not diminish the number of students in our Medical Schools. This year there has been a slight decline in the attendance on the Homœopathic Medical College, but this was due to other causes than the extension of the term. In the Department of Medicine and Surgery there was a handsome gain. So convinced are we that the public are ready for another forward step in medical education that we have now decided to establish a full three years' graded course. It is thought proper to allow those who have already entered upon their studies to receive their degrees on the conditions named when they matriculated. But all who enter after the present University year will be required to take three full courses of nine months each. The best schools are so clearly perceiving the need of thorough and prolonged instruction, that before long the three years' course bids fair to be generally adopted. If it has heretofore been true that in no department of education was improvement more sadly needed than in medical education, it may now be said that in no department of education is improvement more rapidly going on at the present time.

It appears from the official reports of the Medical Schools that 936 patients were treated at the clinics last year. A large number of important surgical operations were successfully performed. The hospital is in fact a great public charity.

Partly because our hospital accommodations were too limited, and partly because it was not found practicable to care for patients of the two medical Schools in the same building, the Legislature were asked by the Regents to make an appropriation for the erection of a separate ward for the patients who seek Homœopathic treatment. The request was cheerfully granted, and an additional sum was voted for the erection of an amphitheatre in which operations could be performed in the presence of the Homœopathic class. The new structures are nearly completed.

The Regents also in June made an appropriation from the General Fund, for the erection of an amphitheatre to be connected with the Hospital, which is under the charge of the Faculty of the Deparment of Medicine and Surgery. This has long been sorely needed. The patients have necessarily been transported from the Hospital across the campus to the Medical College, and after being operated on have been carried back to the wards. The discomfort and exposure and consequent danger to life have been greater than it was pleasant to think of. The enlarged and improved accommodations for the patients are a source of great satisfaction.

The prosperity of the Law School, which is so helpful to our treasury, and so gratifying to us in every respect, threatens to become temporarily embarrassing. We were forced to make some changes in the lecture room last year in order to provide the requisite number of seats for the large classes. If there is any considerable increase in the attendance this year, it is not easy to say how all are to be accommodated. The friends of the school will hear with pleasure that the resources of the University enable us to add a Professor to the Faculty, and so to secure more thorough instruction for the Junior class.

The School of Pharmacy has a wholesome and steady life. The pressure for admission to it has been so great that its Faculty have deemed it wise to announce that on and after September, 1880, the requirements for matriculation will be increased. A specified amount of knowledge of Algebra and of either Latin or German will be asked.

The Dental School advances with the most encouraging vigor. At the beginning of the year so many students presented themselves that the rooms provided for clinical and for mechanical purposes were altogether too strait. The Regents therefore at the October meeting decided to erect an addition to the Dental Building,pay for it by drawing from the General Fund, and ask the Legislature to reimburse the General Fund. Ample accommodations were thus provided. The new rooms were ready for occupancy early in the winter, and the Legislature made the needed appropriation.

The friends of the University may well express their grateful appreciation of the timely aid which the Legislature lent to us at the last session. They made an appropriation for each of the years 1879 and 1880 of $2,000 for the purchase of books for the General Library, of $3,000 for Hospital expenses, of $2,000 for extended instruction in the Homœopathic Medical College, of $4,500 for the Dental College, and of $20,000 for erecting a fire-proof Museum. Besides, they appropriated $3,250 to pay for the addition to the Dental College Building, $1,000 to enlarge the Matron's apartments in the Hospital, $6,500 for a Homœopathic Hospital and Amphitheatre, $1,250 for the expenses of the Homœopathic Hospital in 1880, and $20,000 for erecting a central boiler house and providing steam heating apparatus for several of the University buildings. The total sum appropriated for 1879 was $62,250, and for 1880, $32,750. The Appropriation bills will be found in the Appendix.*

The new heating apparatus will probably diminish the expense of heating our buildings and will certainly diminish the risk from fire. The new Museum Building will enable us to store and display our collections much better than has heretofore been possible, and will relieve us of the solicitude we have so long felt concerning their safety. The sum placed at our disposal will not be adequate to furnish the lecture rooms, which ought to be connected with the Museum. We shall hope to secure them by some means at no distant day. By the action taken at the June meeting of the Board the large and valuable collection, which Professor Steere made in his tour in South America and the East Indies, has come into the possession of the University on such terms that there can be, it is understood, no controversy about the title.

I cannot forbear again calling attention to the fact that we need a new Library Building quite as much as we needed a Museum Building. The Law Department requires the room in which our General Library is now stored. The building is not fire-proof. The Library room is not capacious enough to hold our books or to accommodate our readers. We ought to have a reading room which can hold at least three hundred readers and provide them with good air. The Library must be the centre of the intellectual life of the University. It should therefore be cared for with the most scrupulous pains and be nourished with the largest generosity. I doubt if, in proportion to its size, any Library in the world is as much used as ours. Statistics carefully gathered show that from the Harvard Library with its 173,000 volumes a smaller number of books is daily drawn than from our little collection of 26,000.

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*See Appendix D.

A well-equipped Gymnasium is also much needed. It would not only contribute to the physical well-being of the students, but would also confer indirectly both intellectual and moral good. The health and consequently the intellectual and moral vigor of not a few of our students suffer from the lack of sufficient and attractive exercise. The undergraduates have for some time been striving to raise funds for the erection of a gymnasium, and have secured the organization of a corporation, which is authorized to receive and invest moneys contributed for that purpose. I heartily commend their enterprise to the generosity of our alumni and of other friends of the University.

The Finance Committee's Report is this year, as it was last year, a cheerful document. Owing to the practice of great economy, and to the large attendance of students, the end of the fiscal year found a large balance in our Treasury. It is this fact which has led the Regents to enlarge the corps of teachers in the Literary Department. No better use can be made of our resources than to improve the efficiency of our instruction.

With a record so inspiring as that of last year to encourage us, with so many proofs before us of the deep interest of our own State and of a large public beyond the limits of our State in our welfare, and with every prospect of prosperity in the year on which we have just entered, we and all friends of the University may with hopefulness and courage look forward to its immediate future.

JAMES B. ANGELL.

APPENDIX A.

ANNUAL REPORT OF THE FINANCE COMMITTEE.

The Finance Committee of the Board of Regents submit their annual report, showing the financial operations of the University for the fiscal year ending June 30th, 1879, with an estimate of the probable receipts and expenditures for the fiscal year ending June 30th, 1888:

RECEIPTS. (*General Fund.*)

Balance on hand July 1st, 1878	$ 10,111	89
Received from State Treasurer University interest	39,226	68
Received from State Treasurer State Aid	31,500	00
Received from Students' Fees and Laboratory Deposits	58,256	82
Received from interest on Treasurer's Account	765	75
Received from sale of Book	1	86
Received from State Treasurer on account Dental College Addition	3,250	00
	$143,113	00

RECEIPTS. (*Special Funds.*)

Received from State Treasurer for Homœopathic Medical College	6,000	00
Received from State Treasurer for Extended Term Homœopathic Medical College	2,500	00
Received from State Treasurer for Extended Term Department Medicine and Surgery	4,500	00
Received from State Treasurer for Salary of Professor of Geology	2,000	00
Received from State Treasurer for Salary of Professor of Physics	2,000	00
Received from State Treasurer for General Library	2,000	00
Received from State Treasurer for Hospital	3,000	00
Received from State Treasurer for Dental College Salaries	4,500	00

Received from State Treasurer for Dental College Apparatus	$	560 00
Received from State Treasurer for Physiological Laboratory		1,000 00
		$28,000 00
Total Receipts from General Fund and from Special Funds as above		171,113 00

DISBURSEMENTS. (*General Fund.*)

Paid Warrants for Salaries of Officers, Professors and other Employes of the University	$	70,790 00
Paid Warrants for Special Claims as per Resolution of the Board June 25th and 27th, 1878		1,106 29
Treasurers' Disbursements as per vouchers submitted		42,581 67
		$114,477 96

DISBURSEMENTS. (*Special Fund.*)

Paid Warrants of Professors and other Employes as follows:

For the Homœopathic Medical College	$	5,327 74
For the College of Dental Surgery		4,100 00
For the School of Mines		1,700 00
For the Professor of Geology		2,000 00
For the Professor of Physics		1,700 00
For the Professor of Physiological Laboratory		750 00
For the Extended Term Department Medicine and Surgery		4,500 00
For the Extended Term Homœopathic Medical College		1,525 00

Treasurer's disbursements from Special Funds per vouchers:

For Homœopathic Medical College	$	1,199 62
For College of Dental Surgery		22 19
For Dental College Apparatus		406 38
For School of Mines		39 25
For Astronomical Observatory		503 78
For Physical Laboratory		122 16
For Physiological Laboratory		152 46
For Hospital		2,838 85
For General Library		1,037 12
	$	27,924 55
Balance carried to new account		28,710 49
		$171,113 00

The following detailed statement shows for what purposes the Treasurer's disbursements on vouchers were made:

For Contingent Fund	$ 5,151 59
For Attorneys' and Accountant's Fees	2,997 96
For W. S. George Printing Account	48 00
For Students' Fees refunded	1,005 00
For Steam Pump from G. S. Wormer & Co	201 20
For Annual Calendar	921 20
For J. B. Dow, Stuccoing Dental College	199 67
For J. B. Steere, Beal Steere Collection	4,500 00
For J. W. Hunt, overdrawn appropriation Astronomical Observatory	72 70
For James Tolbert overdrawn appropriation Astronomical Observatory	334 97
For G. J. Pease, overdrawn appropriation Astronomical Observatory	196 37
For Alterations and Repairs	2,708 15
For Fuel and Lights	5,043 23
For Grounds	513 23
For Insurance	2,105 24
For Engineering Department	419 64
For Postage	653 33
For General Library	1,905 01
For Law Library, including Amount Paid for Advertising	653 01
For Medical Library, including Amount Paid for Advertising	643 08
For Department of General Chemistry	465 96
For Clinics, Department Medicine and Surgery	363 48
For Museum and Microscopical Laboratory	542 14
For Chemical Laboratory	6,574 80
For College Dental Surgery	3,892 66
For Physical Laboratory	470 05
	$ 42,581 67
The cash balance on hand June 30th, 1878, as per last Report was	10,111 89

Which amount was made up by the following debit and credit balances of the different accounts.

CREDIT BALANCES.

General Library Fund	$ 887 92
Physiological Laboratory	279 91
Hospital	1,258 93

Homœopathic Medical College	$ 2,042 07
School of Mines	3,375 00
Dental College	27 64
Observatory	503 78
Physical Laboratory	122 16
Dental salary account	200 00
Geological Professor, salary	1,000 00
Professor of Physics, salary	1,100 00
Extended Term Department of Medicine and Surgery	2,250 00
Extended Term Homœopathic Medical College	2,500 00
	$ 15,547 41

DEBIT BALANCES.

Dental College	$ 1,484 21
Mining Engineering	249 07
Current Expenses	3,702 24
Due amount of overdrawn accounts	$ 5,435 52
Showing as stated cash balance on hand June 30th, 1878	10,111 89

RECAPITULATION.

Receipts during the year—General Fund	$133,001 11
Amounts paid out of General Fund	114,477 96
Amounts transferred to College of Dental Surgery	1,506 40
Amounts transferred to School of Mines Equipment	249 07
Amounts transferred to Hospital	500 00
Amounts overdrawn from General Fund previous years	3,702 24
Leaving a balance to the credit of the General Fund of	$12,565 44

The amount received from the State Treasurer on account of special appropriations during the year was $28,000 00.

The balance on hand at the commencement of the year	$ 10,111 89
The amount due from General Fund	3,702 24
The amount transferred by resolution of the Board October 10th, 1878, to Dental College	1,506 40
The School of Mines Equipment	249 07
The Hospital	500 00
Receipts during the year—Special Funds	$ 44,069 60
Disbursements during the year	27,924 55
Leaving a balance to the credit of the Special Funds	$ 16,145 05

By the liberality of the Legislature the following appropriations were made for the purposes enumerated below:

For the erection of a fire-proof Museum Building	$ 40,000 00
For the General Library for the year 1879	2'000 00
For the General Library for the year 1880	2,000 00
For the Hospital for the year 1879	3,000 00
For the Hospital for the year 1880	3,000 00
For the Homœopathic Medical College for the year 1879	2,000 00
For the Homœopathic Medical College for the year 1880	2,000 00
For the Dental College for the year 1879	4,500 00
For the Dental College for the year 1880	4,500 00
For credit General Fund for addition to Dental College	3,250 00
For Steam Heating Boiler House, Coils, Radiators and Connections	20,000 00
For building Homœopathic Hospital	6,500 00
For enlargement of Matron's House	1,000 00
For the Homœopathic Hospital for the year 1880	1,250 00
	$ 95,000 00

Of the appropriations thus made by the Legislature $62,250 00 will be available during the year 1879, and $32,750 will be available during the year 1880.

The estimated receipts for the fiscal year ending June 30th, 1880, are as follows:

Balance in the Treasury June 30th, 1879	$ 28,710 49
For interest on University Fund	38,000 00
For Annual State Aid, "Act of 1873"	31,500 00
For Annual State Aid, "Act of 1875," Homœopathic Medical College	6,000 00
For Students' Fees and Laboratory Deposits	50,000 00
For State Aid, "Act of 1879," Museum Building	40,000 00
For Steam Heating Boiler House, Coils, Radiators and Connections	20,000 00
For the General Library for the year 1880	2,000 00
For the Hospital for the year 1880	3,000 00
For the Homœopathic Medical College for the year 1880	2,000 00
For the College of Dental Surgery for the year 1879	4,500 00
For the College of Dental Surgery for the year 1880	4,500 00
For the building a Homœopathic Hospital	6,500 00
For the enlargement of the Matron's House	1,000 00
For the Homœopathic Hospital for the year 1880	1,250 00

For the Homœopathic Medical College for the year 1880	$ 2,000 00
For interest on Treasurer's account	500 00
	$241,460 49
Estimated Disbursements for the year 1879–'80	$221,662 50
Estimated balance June 30th, 1880	$ 19,797 99

The estimated disbursements for the same time are as follows:

For salaries of Officers, Professors and Employes in all departments of the University	$101,112 50
For Alterations and Repairs	5,000 00
For Fuel and Lights	6,000 00
For Grounds	600 00
For Insurance	2,500 00
For General Library	2,000 00
For Medical Library	500 00
For Law Library	500 00
For Annual Calendar	1,200 00
For Printing Regents' Proceedings	500 00
For Postage	800 00
For Engineering Department	500 00
For Department of Physics	500 00
For Apparatus for Dental College	1,000 00
For Current Expenses of Dental College	1,000 00
For Chemical Laboratory Supplies	6,000 00
For Apparatus for Physiological Laboratory	1,000 00
For Current Expenses of Homœopathic Medical College	1,500 00
For Publication of General Catalogue	1,000 00
For Advertising Department of Medicine and Surgery	200 00
For Advertising Department of Law	200 00
For Advertising Department of Literature, Science and Arts	200 00
For Advertising Homœopathic Medical College	200 00
For Advertising College of Dental Surgery	200 00
For Museum Building	40,000 00
For Steam Heating, Building Coils, Radiators and Connections	20,000 00
For Building Homœopathic Hospital	6,500 00
For Building Clinic Amphitheatre Department Medicine and Surgery	2,500 00
For Enlargement of Matron's House	1,000 00
For Equipment of Homœopathic Hospital	1,250 00

For Hospital and Clinics	$ 3,000 00
For Museum and Microscopic Room	1,000 00
For Contingent Expenses	8,000 00
For Regents' Expenses	1,000 00
For Advertising School of Pharmacy	200 00
For Changes in Heating Medical College and new Amphitheatre	3,000 00
	$218,662 50

The annual report of the Treasurer, with a full list of all warrants paid, is herewith submitted. (This list of warrants has been compared with the books of the Secretary of the Board of Regents and found correct.)

Your Committee submit herewith a list of all the officers, professors and employes of the University, with the amount of salary paid to each.

The receipts from the State Treasurer have been compared with the statement furnished by the Auditor General under date of Sept. 29, 1879, and found correct. Such statement is offered as Exhibit A.

The receipts for Students' fees and Laboratory deposits have been examined with the tickets issued by the Secretary of the Board of Regents and found correct.

The vouchers for contingent expenses have also been carefully examined and agree with the report of the Treasurer.

Your Committee record with pleasure the large increase in the revenues of the University and increased number of its students, and trusts that with a wise and judicious expenditure of its means that its surplus may be expended in furnishing its libraries and increasing the facilities for instruction in the various departments of the University.

Respectfully submitted,

ANDREW CLIMIE,
Chairman Finance Committee.

APPENDIX B.

REPORTS OF THE DEANS OF THE PROFESSIONAL SCHOOLS, AND OF THE PROFESSORS OF THE DEPARTMENT OF LITERATURE, SCIENCE AND THE ARTS.

[The following Reports have been prepared and presented to the President at his request.]

I.

THE DEPARTMENT OF MEDICINE AND SURGERY.

In the absence of Professor Palmer, who was last year Dean, I have been requested to prepare the report on the condition of the Department of Medicine and Surgery, and the contemplated changes in its courses of instruction. I have the honor to submit the following:

The year past has been one of signal success and prosperity. Entered upon with no little solicitude lest the changes in the plan of instruction might decrease the numbers of our students, it is in the highest degree gratifying to be able to report just the reverse—a steady increase of numbers. The attendance also has been much more regular and uniform, for we have adopted the plan of marking the attendance at each lecture and holding the students to accountibility for absence. It is pleasing to report, however, that there is almost no disposition on the part of the students to absent themselves, but rather a promptness and willingness, which indicate an earnestness and devotion to work, which are very encouraging.

The changes above alluded to, were the requirement of a preliminary examination of all candidates for admission, excepting graduates of colleges or academies of recognized standing—and the lengthening of the term of instruction to nine months — to conform to that of the collegiate department proper. The first of the changes went into effect with the session of 1875–76, and at that time no other medical college in the country required such an examination. The lengthening of the term was made in 1877-78, but was not fully enforced until this year. At that time there was but one school, (the Medical Department of Harvard University), which had a term of equal length. Encouraged by the success of these changes which indicate on the part of the students a correct and high appreciation of the greater advantages secured, the Faculty have decided to make a still greater advance by requiring attendance during three full collegiate years (instead of as formerly but two), and by arranging the studies in their natural and progressive order—dividing the students into classes accordingly. This change it is now announced, by the authority of the Honorable Board of Regents, will go into effect with the collegiate year of 1880-81. Students who have matriculated prior to that date will, of course, be allowed to graduate upon the conditions which were in force, at the time of their admission for the relations of the school to all such are in the nature of a contract, which there is no disposition to violate even if there were legal authority for so doing. Attendance upon the full course of three years, will, however, be compulsory upon newcomers. This change in the policy of the department is a matter of congratulation, for it places us in the front rank of the medical colleges of the country in the matter of advanced medical education. Indeed, at the present writing, there are but three schools where the graded and lengthened system has been adopted, though several other schools, like ourselves, have announced it for the future. Even if the change should be attended with the loss of some of our numbers there will be ample compensation in the higher attainments and greater proficiency of those who go out from our walls to the practical work of the profession. The division of the students into classes will enable more thorough and personal instruction for the numbers now are so large that the class is unwieldy and cannot receive that personal attention from the instructors which is so essential to thorough discipline and learning.

The lengthening of the term to nine months necessitated this year the anomalous expedient of two Commencements—one of which was held at the end of six months, the old term, the other at the end of nine months, the new term. This will not again occur, as it is not deemed necessary or desirable to hold a special Commencement for the few students who will be entitled to graduate at the end of the first six months of the coming term.

The facilites for clinical instruction afforded by the hospital have greatly aided the work of training our students. During the collegiate year the wards have been crowded, and many important operations have been performed in the presence of the class. Sections of the class also have had daily access to the wards and thus have become familiarized with the details of the every day care and treatment of patients, a work more beneficial to the student than the mere witnessing of the performance of operations, no matter how brilliant or severe. The hospital facilities have also attracted larger numbers of patients than before, so that our wards, ample as they were believed to be when the new hospital was erected three years since, are frequently overcrowded. The erection of the new kitchen and dining-room has greatly increased the comfort of the patients and rendered the administration of the hospital much easier. The new amphitheatre attached to the hospital will, when completed, be of great service, for no longer will it be necessary to subject patients after operation to the dangers of exposure, in transporting them across the campus from the college to the hospital, and furthermore, it will give us what will be a necessity under the new arrangement of the classes—an additional lecture and recitation room.

The physiological laboratory which is now in full operation under the competent care of Dr. Stowell, has greatly added to our means of instruction, for students are thus enabled to obtain a practical knowledge of this fundamental study—physiology—which it is impossible to acquire from lectures, no matter how fully illustrated they may be. The use of the microscope, which is so important, and to-day even necessary in the every day work of the physician can only be learned by actual practice, and the benefits which are accruing to our students from this source, have already more than compensated for the trifling appropriation which was required to establish this department of instruction.

In addition to the regular lectures and clinics, which have been conducted by the Professors—recitation or quizzes, have been held almost daily by the assistants to the various chairs. In this way we have secured an amount of drilling of the students, that could not have been obtained in any other way. The quizzes are as a rule confined to the subject matter of the lectures—and the good resulting from such drilling has fully justified the wisdom of appointing assistants. Under our new system of instruction there will be still further room for their services, for instead of one class, we shall then have three classes to teach, which will demand from the entire corps of teachers a greater amount of time than is now given to the work.

The Board of Examiners appointed by the Regents, to act in concert and with equal powers with the Faculty in the final examinations of the students for their degrees, began their work this year, and the experiment has thus far proved satisfactory to all parties concerned. It is a step in the direction of disassociating entirely the graduating from the teaching power. In colleges where the emoluments of the teachers are directly proportioned to the numbers of students, there is danger of low standards and insufficient requirements. With us, where the salary is fixed, no such consideration can avail, but notwithstanding this, the step is one we heartily approve of, for it is in the right direction, and we would willingly for the sake of the good influence of it upon the standards of education, see it carried to the stage of complete separation.

E. S. DUNSTER, M. D.,
Professor of Obstetrics and Diseases of Women.

II.

THE DEPARTMENT OF LAW.

The Law Department had a prosperous session during the year, without the occurrence of any event calling for special remark. The whole number of students was larger than in any preceding year, and the Graduating Class was also considerably larger. Every year the Department feels more and more the necessity for increased facilities for doing its work, and especially for increased library and reading room accommodations. How imperative this want is can scarcely be understood by any one unless the crowded lecture rooms and reading rooms are visited and inspected in person. That the accommodations are much less than those provided for any other Department or School is well known and understood, and it is earnestly hoped that speedy provision may be made for increasing them. The whole building where the Department gives instruction was erected for its use, but it has up to this time given accommodation to the General Library. much to its own inconvenience, and somewhat no doubt to its detriment. This whole building should as speedily as possible be given up for the use of those for whom it was erected.

Since the close of the year the Department has been strengthened by the establishment of a new Professorship, and the appointment thereto of a gentlemen of eminent legal ability, whose time and attention will be chiefly given to the Junior Class. The need of this Professorship has been much felt, and much benefit is anticipated from it.

T. M. COOLEY, Dean.

III.

THE SCHOOL OF PHARMACY.

The work in the several didactic and practical branches of this Department is given separately to students in the First and Second years, as it has been done, in the main, since 1872-3. We trust that some increase in strength has been attained this year in nearly every study. Commencing the First year's work, as announced, on the 24th of September, we gained some time when most valuable. The semester's work in micro-botany and pharmacology, under Assistant Professor Spalding's charge, is a very valuable part of the course, and well appreciated by the students. I am very glad indeed that provision is made now, for the next year, to give suitable class-drill in the immediately practical branch of Materia Medica,—the lack of which has been for some time acknowledged.

The original work requisite for graduation has been a source of constant study by the Senior students through the second semester, though an average time of only about two months has been obtained for the experimental work itself. This brief opportunity has enabled us to contribute something to the stock of common knowledge. To show what has been undertaken some reports may be referred to, thus: Of the twenty-eight graduates of 1877, eighteen were engaged in work which seemed worthy of report in the serial publications of chemistry and pharmacy. At least ten of these reports gained general circulation in the European journals and year-books. The Jahresbericht der Pharmacie (Göttingen), for 1876, contains abstracts of the reported work of seven of our students; that for 1877, reports of the work of six. The Proceedings of the American Pharmaceutical Association, for 1878, contain reports and selected abstracts of the work of fourteen of our students; the same for 1876, reports from nineteen. Also, the English journals of chemistry and pharmacy have given a good share of these contributions.

As stated in the current University Calendar, the requirements for admission to this Department have been extended, to take effect in 1880. Preparatory to the action of the Faculty in this matter, an impersonal canvass of the class admitted in September, 1878, was made as to qualifications in arithmetic, algebra, geometry, rhetoric, Latin, German, French, elementary chemistry, systematic botany, and as to high school graduation. From this inquiry it appeared probable that 70 to 80 per cent. of the class canvassed would be able to enter under a faithful execution of the requirements then adopted, at least after a few months of review work. And it seemed to the Faculty that, as additional requirements, those of arithmetic and algebra, with a year's work in Latin or in German, would make the most suitable form and extent of advance. Some reduction of numbers is expected to result from this advance, but the character of the admissions for the ensuing year (which this writing is late enough to give) would indicate that the reduction will not be very great. Of the new applicants in September, 1879, 44 per cent. entered upon diploma of high school graduation, or upon college standing; while of the applicants by examination, under the previous requirements, 14 per cent. were rejected.

The numbers of students and graduates for the past five years have been as follows:

	In first year.	In second year.	Graduates.
1874-5............	45	24	18
1875-6............	46	33	31
1876-7............	35	29	28
1877-8............	44	25	22
1878-9............	43	28	25
[1879-80..........	49	32]	

ALBERT B. PRESCOTT, Dean.

IV.

THE HOMŒOPATHIC MEDICAL COLLEGE.

On behalf of the Homeœopathic Department of the University of Michigan I herewith transmit a brief report of the work of the College for the Academic year 1878 and 1879.

The session comprises a period of nine months, from October 1st to June 26th, during which time, with the exception of the usual holiday recess and the March Commencement, the Professor of Surgery has delivered four lectures per week and held two clinics per week, averaging one and one-half hours each; the Professor of Theory and Practice has delivered six lectures per week and held two clinics per week of one hour each; and the Professor of Materia Medica has delivered four lectures per week throughout the course.

The students of this Department also attended throughout the course the lectures on Anatomy, Obstetrics, Physiology and Chemistry delivered by the Professors of the "Department of Medicine and Surgery."

In addition to the didactic and clinical teaching, frequent oral and written examinations were held by the members of the Faculty and their assistants during the evenings, and a quarterly examination was held upon the medical and surgical topics gone over the preceding three months, to test the literary and medical scholarship of the senior class.

The afternoons and evenings were frequently occupied in the Chemical, Microscopal and Anatomical Departments, a large proportion of the students attending the Practical courses of these fundamental branches.

The entire number of students in attendance upon the College was sixty-three, twenty-one of whom graduated at the March Commencement, and four at the June Commencement.

The Surgical course was mainly delivered upon the "Principles of Surgery," under the provisions of the "graded course;" the "operative" department being reserved for the succeeding year.

The Therapeutics (homœopathic) of Obstetrics and Gynæcology were imperfectly taught by the chairs of Surgery and Practice, owing to the large field of study gone over by these two departments of medicine. It is to be hoped that at the next session of the Legislature ample provision will be made for a more thorough and scientific teaching in these two important branches of medical education.

The "Examining Board" of Physicians appointed by the Honorable, the "Board of Regents" at their June meeting last year, to act in conjunction with the Faculty of this College, to examine the candidates for graduation therein, have performed their duties faithfully and creditably, but it is very questionable whether, under all the circumstances connected with she instruction and examination of our students by those in the "Department of Medicine and Surgery" who have taught them in the fundamentals of the profession, our students have benefited by the change inaugurated.

Since the March examination considerable dissatisfaction has arisen among the members of the class, and I fear the consequences of this innovation will be felt in the inharmonious relation of our classes hereafter to their preceptors of the other Department.

In conclusion 1 will add that quite a large correspondence has been opened up with practitioners of our system in near and distant portions of the States, with whom I have long enjoyed friendly professional and professorial relations, which I trust will increase the future numbers of our classes and widen the sphere of usefulness of this University and its Homœopathic Department.

E. C. FRANKLIN, Dean.

V.

THE DENTAL COLLEGE.

The following report of the work accomplished in the Dental College during the past year is respectfully submitted.

The term of 1878–9 showed an increase in the attendance of more than forty per cent over the former year.

The requirements in the preliminary examination are each year a little more exacting and more extended. This year quite an advance has been made in this respect.

The course of instruction, both didactic and clinical, was raised to a somewhat higher standard than formerly.

The students have attended the full regular course in the Medical Department, except in a few instances, in which the work in the Dental College occurred at the same hours; and have gone over well-nigh as thoroughly as the medical students the entire ground of the medical course, including the work in the Physiological Laboratory, in Analytical Chemistry and in Practical Anatomy.

The special work has been carried on in such a manner as to give to the students a thorough practical knowledge. This has been accomplished largely through the increased facilities given by the authorities of the University; and by the appreciation of the public, which has resulted in an ample supply of patients for the operating rooms, and given to the students an unusual opportunity for practical instruction.

One of the requirements for graduation is attendance upon two full courses of instruction, and notwithstanding the term is longer than in any similar institution in the country, with one exception, yet about one-half of the present class have decided to take three courses and quite a number will extend the term to eight or nine months.

This circumstance, taken in connection with the extent of the curriculum, has rendered it necessary to devise and adopt a graded course; and though this is not yet in full operation, still the advantages are beginning to be quite apparent, in the relief of the students from the excessive amount of work heretofore imposed, and the more thorough mastery of the work in hand.

The steady and apparently permanent growth of the College, from the beginning to the present, shown by the increase in attendance, amounting to over thirty per cent annually, together with the appreciative exhibited by the Dental Profession, and the favor of the public, afford promise of prosperity and success in the future and ground for gratification to all concerned.

J. TAFT, Dean.

VI.

THE DEPARTMENT OF LITERATURE, SCIENCE AND THE ARTS.

I.—FROM THE PROFESSOR OF THE LATIN LANGUAGE AND LITERATURE.

The Professor of Latin Language and Literature respectfully presents the following report of the Courses of study under his charge, and of the number of students in attendance for the year 1878–9.

COURSES OF THE FIRST SEMESTER.

1. The studies of this Course were Latin Grammar, taught by topics and with references to the grammars, Latin Prose Composition, and, as a classical text, selections from the comedies of Terence. It was attended by students of the first year numbering *one hundred and two*, divided into three sections, and each reciting to Assistant Professor Walter four times a week.

2. The tenth book of Quintilian's Institutio Oratoria was the text-book of this course, accompanied with notes on Roman Literature. *Eighty-eight* students, mostly of the second year, were in attendance, divided into two sections, each coming together three times a weeek.

3. Owing to the difficulty of procuring the text of Pliny's Natural, History, designed as the basis of this course, it was omitted.

4. The first book of Cicero's Tusculan Disputations, used in the fourth Course, was studied chiefly with reference to the argument, and with only incidental attention to grammatical criticism. The class consisted of *ten*, reciting twice a week.

5. This Course, consisting of selections from Pliny's Letters, alternating with lectures on Classical Art and Antiquities, was attended twice a week by a class of *eleven*.

6. The practical exercises of Course sixth, designed to meet the wants of those advanced students who are looking forward to the work of teaching in the preparatory course in the High Schools, were based upon the first and second books of the Aeneid, and were attended once a week by a class of *twenty*.

Courses 2, 4, 5, and 6, were all conducted by the Professor of Latin, and the classes in all, with the exception of the second Course, consisted of students of more than two years' residence.

COURSES OF THE SECOND SEMESTER.

7. The number in this Course, which was under the instruction of Prof. Walter, was *ninety-six;* all students of the first year. They were divided into three sections, reciting each four times a week. The

studies were the 21st and 22d books of Livy, and Roman History to the reign of Augustus.

8. The eighth Course consisted of selections from the Odes and Epodes of Horace, with the prosody, and was attended by *thirty-nine* students of the second year, under the Professor of Latin. The recitations were held twice a week.

9. Instructor Thomas had charge of this Course, which consisted of the Ars Poetica of Horace, and the Satires of Juvenal; attended by *seventy-four* students of the second year, in two sections, each three times a week.

10. The class of advanced students pursuing the study of Tacitus in this Course, numbered *twenty-four*, meeting three times a week under the Professor of Latin.

11. A class of *eleven* met once a week under the Professor of Latin to read selections from the Moral Treatises of Seneca. The pieces selected were "De Providentia," and "De Tranquilitate Animi."

12. The lectures on Classical Art and Antiquities, proposed in this Course, were given by the Professor of Latin, and attended by a class of *fifty-five*; nearly all of more than two years' residence.

13. The exercises of the thirteenth Course were a continuation of those of Course six, and were attended by a class of *sixteen*.

It will be seen from the foregoing statement, that the whole number of students in attendance upon the Latin Courses of the First Semester was two hundred and thirty-one; and on those of the Second Semester, three hundred and fifteen. The classes under the immediate charge of Assistant Professor Walter and Instructor Thomas have done their work in a manner which reflects great credit upon those officers; and so much the more as they have been overtasked with the duty of giving instruction at once in other languages as well as in Latin.

In the lectures on Classical Art and Antiquities, our means and material of illustration have been found painfully deficient. Though this University was one of the first, if not the first in this country, to get together the beginnings of an art collection, consisting of casts, engravings, photographs and medallions, forming the nucleus of a museum; the original collection, made more than twenty years ago, has received but very small accessions, and is quite inadequate to the proper illustration of a complete course of lectures. It is hardly necessary to say that, in these times, when the *practical* importance, as well as the cultivating influence of art study, is so generally appreciated in all well educated communities, a University which lacks apparatus of this kind, must be considered imperfectly equipped.

H. S. FRIEZE.

II.—FROM THE DIRECTOR OF THE OBSERVATORY AND PROFESSOR OF ASTRONOMY.

During the last year the work at the Observatory consisted, for the most part, of the usual routine work. Mr. Schaeberle was occupied in computing extended tables of parallax and refraction adapted specially to the Ann Arbor Observatory, and in observations of comparison stars with the Meridian Circle.

In addition to the routine work, I reduced and forwarded to Washington for publication my observations connected with the Transit of Mercury and those made at the time of the recent total eclipse of the sun.

JAMES C. WATSON.

III.—FROM THE PROFESSOR OF MATHEMATICS.

During the academic year 1878–79 all the courses in Pure Mathematics offered in the Calendar for that year were given, and in addition a course in trigonometry the first semester. These courses were as follows; and the figures appended give the number of students who received instruction in each course respectively:

FIRST SEMESTER.

1. Advanced Algebra. *Four times a week.* Asst. Professors Jones and Beman. 125 students in 5 sections.
2. General Geometry and Calculus. *Four times a week.* Prof. Olney and Asst. Prof. Beman. 85 students in 4 sections.
3. Advanced General Geometry and Calculus. *Five times a week.* Prof. Olney. 6 students.
4. Determinants. *Once a week.* Asst. Prof. Jones. 12 students.
5. Trigonometry. *Twice a week.* Asst. Prof. Beman. 25 students.

SECOND SEMESTER.

6. Advanced Geometry; Plane and Spherical Trigonometry. *Four times a week.* Asst. Prof. Jones. 90 students in four sections.
7. General Geometry and Calculus. *Four times a week.* Prof. Olney and Asst. Prof. Beman. 85 students in 4 sections.
8. Modern Geometry and Trilinear Co-ordinates. *Twice a week.* Asst. Prof. Beman. 3 students.
9. Calculus of Variations. *Twice a week, first half of semester.* Prof. Olney. 8 students.
10. Quaternions. *Twice a week, second half of semetser.* Prof. Olney. 6 students.

To the above courses it is proposed to add a two years' course of Mathematical reading in such standard works as Salmon's Higher Algebra, Frost's Solid Geometry, Destor's Determinants, Todhunter's or Price's Integral Calculus, Taite's Quaternious. Such a course of reading will be offered as soon as there shall be a sufficient demand for it to justify the instructors in devoting the requisite time to the subject.

E. OLNEY.

IV.—FROM THE PROFESSOR OF HISTORY.

I beg leave to present the following report in regard to the study of History as pursued in the University during the last academic year.

In accordance with usage long since established, all studies in Ancient History were conducted during the past year by the officers in charge of the departments of Greek and Latin. The amount of instruction regularly given in Greek and Roman History is sufficient to enable the student to gain a general familiarity with the historical development of ancient civilization. In addition to the regular work of recitations from the text-books used, courses of lectures by Professors Frieze and D'Ooge on the growth and characteristics of ancient art and literature have contributed during the year greatly to the interest and profit of the students.

In the reorganization of the historical work made necessary by the changes of the previous year, a number of distinct objects were kept clearly in view.

In the first place, it was thought desirable to afford all students an opportunity to gain a comprehensive view of general history from the fall of the Roman Empire down to the present century. For the accomplishment of this purpose, two courses of lectures were offered and given; one in the first semester and one in the second, each course consisting of three lectures a week. In the first course the object kept in view was a presentation of the elements of strength and the elements of weakness which went to make up the institutions and the peculiar civilization of the Middle Ages. In the second semester the general course of events was described from the Renaissance to the outbreak of the French Revolution.

Another object kept directly in view was to give such exact historical information as would be of most service to students in subsequent life. With this purpose, courses were offered in English and American history. During the whole year two lessons a week were given on the history of England from Henry VII. to George III., also two lessons a week on the political history of the United States from the earliest settlements to the close of Madison's administration. The first of these classes was taught by Assistant Professor Pattengill; the second by Assistant Professor Demmon. The text-books used were Bright's excellent History of England, and Eliot's and Von Holst's History of the United States. I am glad to testify that in both classes the instruction was excellent and the results were satisfactory.

A third object was to provide means by which a limited number of students with exceptionally thorough preparation might pursue a more extensive course of study in some special department of historical research. The Historical Seminary has this purpose in view. The class electing this work was organized into sections for the purpose of carrying on investigations in the Constitutional History of England and the Constitutional History of the United States. This work was carried through the whole of the year, each section of the class meeting the professor two hours each week. The work of the students was prosecuted with zeal and sucess.

It has also been thought desirable to do what was practicable to awaken and keep alive in the University a popular interest in historical studies. Chiefly for this purpose two courses of public lectures were given last year; one on the Government of England during the Present Century and one on The Rise of Prussia. Each of these courses contained thirty lectures. Besides being elected by a considerable number of students who passed an examination on the subjects taught, these courses were attended by such numbers as to justify the object in view.

Under the arrangement of courses adopted somewhat more than a year ago, the study of history was made entirely optional in the University. With the exception of the history required for admission, no history is now required of any student as a requisite for any degree. The experience of the past year more than demonstrates the wisdom of this arrangement. If the number pursuing the subject has been slightly diminished by the fact that it is not required for graduation, the disadvantage of this diminution is fully counterbalanced by the increase of zeal with which the work is carried on by the class as a whole. That the diminution of members has given no cause for apprehension the large size of the classes has afforded constant and embarrassing evidence. During the past year large numbers applying for admission to the class in American history had to be excluded; and the number admitted could not have been taught but for the generous and voluntary assistance of Assistant Professor Pattengill.

The number of students electing the study of history during the year were as follows:

Mediæval History, (Prof. Adams)	57
General Modern History, (Prof. Adams)	68
General History of England, 1485–1660, (Asst. Prof. Pattengill)	41
General History of England, 1660–1760, (Asst. Prof. Pattengill)	40
Political History of the United States, 1607–1783, (Asst. Prof. Demmon)	43
Political History of the United States, 1783–1817, (Asst. Prof. Demmon)	73
English Government since 1815, (Prof. Adams)	36
Rise of Prussia. 928–1848, (Prof. Adams)	67
Constitutional History of England, (Prof. Adams)	19
Constitutional History of United States, (Prof. Adams)	18
Total	471

C. K. ADAMS, Professor of History.

V.—*FROM THE PROFESSOR OF MENTAL AND MORAL PHILOSOPHY.*

The professor of Mental and Moral Philosophy respectfully reports the attendance upon his course of instruction as follows:

Psychology	57
Logic and Ethics	45

These were divided into two sections and each met twice a week.

Philosophy proper	87
History of Philosophy	35

These were met five times per week.

Prior to the recent change in the plan of University work, students came to the study of Philosophy with scarce any acquaintance with the subject and consequently the instruction was necessarily elementary. In addition to this, the whole of the work done in Psychology, Logic, Ethics, Speculative Philosophy and History of Philosophy was crowded into the senior year and the time allotted to each study was so short that no more could be presented than a brief outline. Since the "new departure" all these studies have been optional, save Psychology, with the special qualification that either Logic or Psychology must have been taken before the student is admitted to the lectures on Philosophy proper, and the Course in the History of Philosophy. We have thus been able to advance to the consideration of the profounder problems of Speculative Philosophy with students whose minds were prepared by the preliminary discipline of Logic and Psychology and the work has been more satisfactory to the Professor, and we hope much more profitable to the students.

B. F. COCKER.

VI.--FROM THE PROFESSOR OF APPLIED CHEMISTRY.

The instruction in the several branches of analytical chemistry includes both class-room teaching and laboratory teaching; these two modes of instruction advancing together; so that the student's work for the day, at his table, has been directed in the last lecture or recitation of his class, and is to be explained at his next class exercise. In the past year, this use of class study has been strengthened in several of the branches, and has served to give a better qualification of the classes, as well as to economise the teaching force in proportion to the numbers taught. In the classes doing qualitative work, one hour has been taken in the class-room for every two to three hours employed in the laboratory; in the classes having quantitative practice, there has been an hour in class-room with every three to five hours in the laboratory.

THE STUDIES carried, within the collegiate year, have been as follows:

1. Qualitative Analysis. First section, students in the first year of the Pharmacy School; second section, Course 1 of Analytical Chemistry in the Department of Literature, Science and the Arts; 57 students in all; class exercises and laboratory exercises, each, five days a week with each section,—in part for one semester and with the greater number for six months: wholly in charge of Instructor Johnson.

2. Qualitative Chemistry. Five successive sections, composed of students of the Department of Medicine, the Homœopathic College, and the Dental College; in all 195 students; each section having daily class-room drill for about eight weeks and laboratory work for seven weeks. The instruction was given, in the first semester, by the undersigned, and, in the second semester by Assistant Vaughan; with the help, for laboratory teaching, in both semesters, of Mr. Vandivert, student and assistant for partial duty. The time allotted to this course remains about the same that it has been since the work was made a requirement for graduation in the Medical Department, in 1866, but the daily class-drill, taken out of laboratory hours, and beginning with each section a week before laboratory work, and holding each student in the same work each day, gives much better results. Still the time is too short. If we could divide the thirty-five working weeks

into four periods instead of five, the work of the sections would be much more satisfactory. But the five sections still have many applicants unprovided with tables, and a large number of students are unable to obtain places at such time as would be most suitable in the graded progress of their studies.

3. Quantative Analysis. A division of students of the second year of the Pharmacy School, in the first semester, and one of first year Pharmacy students, in the second semester; the separation of these classes being required by limitations of quantitative apparatus and room. The division in the second semester provides for students in Course 5 of the Department of Literature and Scicnce. The full work of the last named Course was given in another class, working through the first semester and half of the second. Each of the three classes had class-room lectures and recitations three times a week, and laboratory practice five times a week. The quantitative teaching has been exclusively in the hands of Assistant Cheever, during the year. The whole number of students has been 42.

4. Physiological Chemistry. The work in this branch consists of five to seven weeks' course in urine analysis required for graduation in the Department of Medicine, the Homœopathic College and the School of Pharmacy; a course of some length in saliva analysis required in the Dental College; and a Medical Elective course, in analysis of tissues and excretions, extending through six months (Course 8 of the Literary Department). 211 students have taken one or other of the two required courses; and seven students, the elective course; during the year 1878–9. The teaching, in the first semester, was done wholly by Assistant Vaughan; in the second semester, wholly by Assistant Professor Rose. The laboratory work was accompanied by lectures and recitations.

5. Toxicology. A course of laboratory practice, with lectures, required in the School of Pharmacy, and elective in the Medical Schools. The work employs about six weeks. It was taught, in the first and second semesters, respectively, by the instructors having charge of Physiological Chemistry. The number of students during the year has been 29.

6. Pharmaceutical Preparations. In the first semester this course of laboratory work was given to a part of the seniors, and in the second semester to a division of the juniors, of the Pharmacy School. We are obliged to make two divisions of the students taking this branch ; so that the work may be distributed through the year, and the classes may be provided for in the room. The class-room instruction for this branch has been that presented in the course of my lectures on

Pharmacy, twice a week till April for juniors, and three times a week till April, then five times a week, through, for the seniors. In the laboratory teaching, I have had the help of Mr. Dawson, student and Assistant for partial duty. 38 students have taken the course.

7. Assaying.—8. Determinative Mineralogy. These courses, (Analytical Chemistry, Courses 9 and 10), each of about six weeks' daily work, have been given to classes, respectively of eight and six students, by Assistant Cheever. In Assaying, lectures were given.

9. Proximate Organic Analysis. This Course, of six weeks' laboratory practice, was given in March and April to 27 in the second year of the Pharmacy School, where it is a requisite. The laboratory instruction was given by Assistant Vaughan. The only class-room instruction furnished was that included in the lectures on Organic Chemistry and Pharmacy, by myself, through the second semester.

10. Original Work. The prosecution of some research by the student, under direction of his teachers, has been established as a requirement for graduation in the School of Pharmacy, and offered as chemical elective in the Departments of Literature, Science, and the Arts, and of Medicine. The work under this requirement for Pharmacy graduation has proved an unequalled means of discipline to the students, given strength and activity to all the work in the senior year and has become a source of much interest to the alumni. The published results of this work have been noticed under the head of School of Pharmacy, as they include original work in branches other than chemistry A few contributions from the work of students of medicine, mostly under the direction of Assistant Vaughan, have attained published circulation and favorable attention, in this country and in England, during the past two years. In the Department of Literature, Science and the Arts, there is encouragement to believe that we shall receive applicants for the Master's and Doctor's degrees, who will be able to give more time and investigations than can be spared from the required technology of the professional schools. In the question of qualification for research, if we cannot quite say, with one of our American educators, that any student who is able to work in a laboratory at all, is able to help in some sort of original determination, we can at least say that any faithful student of two years' training in a laboratory shall be able, under competent direction, to contribute something towards filling out the gaps in chemical science.

The most serious difficulty in our means of conducting original work, is the limited extent of the University library. The chemical part of the library, since the more liberal additions of the last three or four years, suffices reasonably well for the needs of our ordinary required training in analytical and applied chemistry, but it is sadly inadequate for dependence in original work. It is at once the necessity, and the great educational advantage, of experimental research, that it is accompanied by a constant reference to the original records of established science. We are destitute of some of the oldest and richest of the serial repositories of chemical science, a single set of which would absorb the library expenditure in chemistry for the last five years. In much of the original work we have had in hand, we have been quite dependent upon a private library, kept in the laboratory, with permission to be consulted by students and teachers, and the property of an Instructor who has expended more than the first six years of his salary in the purchase of chemical books.

THE ENTIRE NUMBER of students, in the laboratory during the collegiate year of 1878–9, from the several Departments of the University, has been as follows: from the Department of Literature, Science and the Arts, 28; from the Department of Medicine, the Homœopathic College, the Dental College, 274; from the School of Pharmacy, 72; total, 374. The total number in 1877-8 was 351; in 1876–7, 286; in 1875–6, 275.

In regard to the need of room, it should be said that our greatest want is that of another class-room. We have, in a week, thirty to thirty-two recitations, with eight to ten classes. For the first five of these recitations, we have obtained the temporary use of some room in University Hall; and for three, the temporary use of a room in the Medical building. The rest are held in the single class-room of of the laboratory, a room large enough for about thirty persons, though provided with forty permanent seats and often used for classes of forty-five to fifty students. There is much difficulty in arranging the schedule of hours for the week, in the use of one room.

The question of more room for laboratory work will evidently need action of some sort, before very long. The requirements of each Department of the University must be considered: From eighteen to twenty-six tables are occupied by students of the Department of Literature, Science and the Arts. For these students, our non-professional studies are elective, none required, (or, in suspension of the School of Mines, none to be required); the students electing one work for from one to four semesters, taken continuously, and mostly in the last year or two years of their college work. If tables cannot be furnished to these elective students, at the proper time, and after due notice of the electives taken, then the Department of Literature, Science and the Arts is so far destitute of any provision for analytical chemistry. Next, in order of numbers in the laboratory, are the students of the Pharmacy School, occupying from sixty-five to eighty tables. A student in this Department must be furnished a table at the opening of the collegiate year, and through to its close, or his matriculation and incidental fees must be returned to him. The question of a reduction of numbers in this Department is considered elsewhere. Lastly, the demands of the Medical and Surgical Department, the Homœopathic Medical College, and the Dental College, may be placed together, as the students of each have work of equal extent required for graduation. This required work consists of two short courses, one of seven weeks, and one of about five weeks, each of these courses to be taken in any one of five successive classes, during the year of nine months. A limited number take an optional course of nine months' extent. These students occupy from sixty to seventy tables in the laboratory, in fact, all the available tables not required by students of other Departments, who must be provided, as above explained. Upon these sixty to seventy tables, during 1878–9, the 274 students have been provided, for one or both of the required courses. In some of the classes, last year and this, two students have been assigned to one table,—an injustice to the work, to good order, and to the students. Most of the students of these Departments apply for tables by a deposit with the Treasurer, sometime in advance. Some fail to do so, and feel aggrieved at their failure to obtain facilities when they ought to have them. If the pressure of applications in these short required courses should continue, not to say increase, I should be disposed to urge upon the Faculties of the Departments concerned, to remove the requirement of chemical laboratory work, and leave it optional with the student,—unless, indeed, there should be probability of an increase of laboratory room. There are, on the main floor, 141 tables, and no one of these is left unocupied at any time during the nine months. The 28 tables in the basement room, designed for only one branch of work, with air-space enough for about 15 persons, are used for from eighteen to twenty-five workers. The constant number of students in the laboratory places an average of from 33 to 41 workers under the daily instruction of each paid teacher.

ALBERT B. PRESCOTT,
Professor of Applied Chemistry.

VII.—FROM THE PROFESSOR OF THE GREEK LANGUAGE AND LITERATURE.

The past year has been one of unusual prosperity to the Department of Greek. With the restoration of the Assistant Professorship, and the return from Europe of Professor Pattengill, it became possible to divide the large classes into suitable sections, and to give additional opportunity for elective work.

The number of courses offered in each semester was five, of which five were elective in the first and three in the second semester. An additional elective course in the first semester has been added the present year.

The number of students in each course was as follows:

Course 1, (required)	78
Course 2, (required)	64
Course 3, (required)	50
Course 4, (elective)	7
Course 5, (elective)	17
Course 6, (required)	78
Course 7, (required)	64
Course 8, (elective)	35
Course 9, (elective)	9
Course 10, (elective)	18
Total	420

Deducting from this total the number counted twice, we find that 219 students pursued the study of Greek.

In common with other instructors, I have found that our students are trying to carry too many studies at a time, and that in consequence thereof, the average standard of scholarship is seriously affected. While this is a disadvantage of our new system that has already cured itself to some extent, still I am apprehensive that there is serious danger lest through the ambition to accomplish more than the amount required for graduation in four years, or what is worse, to accomplish the requisite amount in less than four years, the good student will fall into the habit of doing his work superficially, and the average grade of proficiency become lowered.

It is still too early to mark any appreciable effect upon the popularity of the Classical course resulting from our new system.

M. L. D'OOGE.

VIII.—FROM THE PROFESSOR OF MODERN LANGUAGES AND LITERATURE.

I take pleasure in reporting, concerning the work of the past year in French, as follows:

During the first semester, four Courses of instruction were offered in French. In Course one, "beginning French," one hundred persons were instructed in two sections, one by Mr. DePont, the other by myself. In the second Course, "Grammatical Analysis, etc.," there were sixty-two students instructed in two sections, by Mr. DePont. The work in this Course consisted in translations from French into English, (Géruzez's Histoire de la Littérature Française, and De Vigny's Cinq Mars, being used as text-books) and from English into French, together with constant drill in composition and conversation. For the study of the classic French drama, in Course three, thirty-one persons presented themselves to the undersigned; the attention of this class was confined to two plays by Moliere and one by Racine. A class in Course four was next formed, partly owing to the unexpectedly large number of students and consequently of sections in other courses, rendering it impossible to pay attention to the few who desired to follow this Course.

In the second semester, Course five, following upon Course one, had seventy-three attendants, instructed in two sections, by Mr. DePont. A play by Alfred De Musset furnished the text for translations. Course six, joining on to Course two, was attended by forty-seven persons, whom Mr. DePont further instructed in the practical use of the French language and in the history of the literature. In Course seven, a study in some of M. Taine's aesthetic writings were offered and followed by thirty to thirty-seven students. The texts used were Taine's Philosophie de l'Art and Art en Italie.

In German, as in French, the number of students has been unusually great and even unwieldly. Prof. Walter and Mr. Calvin Thomas, divided between themselves the instruction of the one hundred and seventy-five persons who at the beginning of the year presented themselves as beginners in German (Course one); at the same time carrying the burden of additional work in other departments. Course two, (Lessing's Emilia Gallotti. and German Lyrics), had twenty-five attendants.

In the second semester, the number continuing German from Course one, now Course three, was not greatly diminished, but all were placed under the direction of Mr. Thomas. Having completed the study of the Grammar, attention was largely directed to reading, each section reading from the German, one comedy and one serious drama, (Jungfrau von Orleans, or Zriny.) I used the first part of Gœthe's Faust, (Course four) with a class or thirty-three, and went over the subject of German Literature with twenty-five students (using a German text-book). I also gave a course of about thirty lessons in Spanish to thirty students.

Of the classes beginning French and German, it is not too much to say that they have been over-crowded. Thirty-five to fifty-five persons is an excessively large number to attempt to teach at once, at the commencement of such a study. Twenty is as many as can be taught with best advantage for the student, in one class. In some Courses, also, heteogeneous elements have been mingled, to the disadvantage of all; a more ample teaching force would enable us to separate them, and do justice to all.

The skill of my assistants, and the good-will and industry of our students have gone far to counterbalance the above named, and other drawbacks. On the whole, the influence of our resolution to make nearly all work in modern languages elective and then to throw it open to all students, has been decidedly favorable. Instructors and scholars lose more and more the spirit of mere routine, and work with fresher interest and higher and more comprehensive aim. Thus in almost every course, more and more varied work has been done than was originally proposed or intended.

I have given about fifty hours during the past year to the direction of post-graduate work in German, not announced or recorded in any published statement of our courses of instruction. Three persons presented themselves for such work, one desiring to carry on the advanced study of German literature, and the other two wishing to acquaint themselves with the style and terminology of philosophical German. The first of these persons was obliged through ill-health to abandon all his work early in the year. The others have read under my direction, and discussed, mostly in German, the whole of Pœtter's Geschichte der Philosophie, in two volumes, all with excellent results. The post-graduate work at the University, has always been, on the part of the instructors, a labor of love, undertaken in addition to other labors, which of themselves are sufficiently engrossing and are constantly becoming more so. At the same time, this is the work, which for many reasons, it is most important to encourage. I desire to state very emphatically, that in my opinion the time has come when the governing authorities of the University should distinctly recognize and honor it, by providing such assistance for undergraduate work that heads of departments may have time left for a thorough development of post-graduate courses of instruction. At present, these courses are too often, and necessarily owing to lack of time, half a pretence. They should be fully reorganized and provided for, or else wholly abandoned.

GEO. S. MORRIS.

IX.—FROM THE PROFESSOR OF CIVIL ENGINEERING.

The work in the Department of Civil Engineering has been divided the past year between Assistant Professor Joseph B. Davis, Mr. Chas. S. Denison, and the writer. The time occupied by each study and course of lectures need not be transcribed from the Calendar; but the division of work is here given, with the number of students in each class.

Mr. Denison's classes have been as follows:--free-hand drawing, six students in the first semester, thirty-five in the second semester; architectural water-color drawing, five; lettering and topography, ten in the first, and nine in the second semester; shades, shadows and perspective drawing, six; drawing for stone-cutting, five; mechanism and machine drawing, eighteen students. Professor Davis has taught the following classes:—geometrical drawing, nineteen students; descriptive geometry, twelve; surveying, seven; higher surveying, seven; and field-work, six students. The review in descriptive geometry was in charge of Mr. Denison when the time of Professor Davis was required for the class in field-work. The writer has given instruction in the following subjects:—analytical mechanics, seven students; strength and resistance of materials, thirteen; theory of engineering construction, thirteen in the first, and nine in the second semester; engineering design, ten; hydraulics, twelve; graphical analysis of structures, ten; machinery, water-wheels, and steam-engine, twelve students.

The recent change in the number of studies prescribed and elective, as requirements for degrees, has affected the department of Engineering but very little, as nearly all of its work is technical and necessarily taken by students who intend to graduate as civil engineers. The late depression in business, with the accompanying falling-off of professional work, has probably deterred some young men from entering upon this course of study; this fact may account for the small size of the classes; but an improvement has apparently begun, as is evidenced by an increase in the number of entering students. The last graduating class in this department was especially successful in obtaining employment; three withdrew just before the Commencement to accept positions which opened, and all of the remainder were at work before the expiration of three months thereafter. It has been noticed that the engineering graduates obtain better positions than formerly, and retain them when obtained.

Since the last report from this department, (1874), several changes in the studies have been made which are thought greatly to improve the course of training offered, and there has been a considerable increase in the appliances for illustrating instruction. The class in surveying has been equipped with a full camp outfit, so that they are enabled to spend four weeks in June, at some distance from Ann Arbor, in a section of country chosen for the difficulty of the problems presented, and employ the time uninterruptedly in a practice railroad-survey, accompanied by work in topography, triangulation, etc., with complete notes, maps and profiles. The last class were in camp at Clear Lake, Waterloo, about twenty miles from Ann Arbor. Their maps, together with the work in drawing of the whole department, were on public exhibition during Commencement week. Such exhibitions have now been made for three successive years. The students in surveying have enjoyed excellent facilities during the past year for assisting, on Saturdays and at other leisure times, in actual professional work, and the practical experience thus gained has been of great advantage to them. Some, more advanced students, also participated in a preliminary survey for the extension of the Toledo and Ann Arbor railroad. It is possible that such opportunities will continue to offer.

The work of engineering design has been largely developed since the last report. From their own calculations of the forces acting upon the structures, and of the sections and proportions of parts necessary to resist such forces, the class made working drawings of a small timber bridge for a highway, a wooden roof-truss of large span, a Howe-truss railroad bridge and an iron roof-truss. Bills of materials for some of these structures were also made, and the cost estimated. Those students who elected engineering design in the second semester made plans for an iron bridge, a masonry abutment, and either an iron arched bridge or roof.

A course in graphical methods for determining strains in structures has been given, having been recently extended to cover, in much detail, the subject of roof-trusses, bridge-trusses, and all arched structures. The work in drawing, in its different branches, has been systematized and expanded.

Some additions have been made to the collection of surveying instruments; the number of photographs, working drawings and other views of existing structures, machinery, etc., has been very largely increased by puurchase and gift; many models of parts of bridges, showing the method of connecting iron-work, models of turbines, samples and shapes of iron, etc., have been added so that the amount of material of this sort has now become very considerable.

Professor Davis and Mr. Denison have been connected with the University in their present capacities during the seven years since the writer assumed the chair of Engineering, and he gladly testifies to their continued thoroughness and efficiency.

CHAS. E. GREENE.

GENERAL LIBRARY

X.—FROM THE PROFESSOR OF ENGLISH LANGUAGE [illegible] LITERATURE.

During the year just closed, the eleven courses of English study as indicated in the Calendar for 1878–9, have been fully carried out.

Courses One and Seven: English Grammar and Speeches. Conducted by Mr. Demmon and Mr. Tyler. During the first semester, a course of two hours a week was given to a class of about forty-five, in Gilmore's "Art of Expression." Written exercises were required illustrating the principles of the text-book. About three weeks after the opening of the semester this class was transferred to Mr. Thomas for the rest of the semester.

In the second semester, Mr. Demmon resumed the work, and a course of two hours a week was given by him to two sections of about forty each in Abbot's "How to Parse" and "How to Write Clearly." Each member was required to write two original speeches and deliver them in presence of his section.

The aim in this course is: *First,*—to explain the difficulties and irregularities of English idioms, and thereby to help the student to a more intelligent understanding and use of them. *Second,*—to teach rules and cautions for securing method in discourse, and clearness and force of expression. These rules are constantly enforced by illustrative examples and by practice in the preparation of manuscripts. The manuscripts are criticised by the instructor before the student commits them for delivery, and not infrequently the student is required to present a revised copy. *Third,*—to teach good habits of public address by speaking under direction and criticism of the instructor.

Hereafter, it is proposed to give this course in the first semester also, in place of the one given this year. The course is designed for first and second year students and is required of all for graduation.

A great embarrassment under which the department labors is the inadequate training in English given by the preparatory schools. In numerous instances, students come with little grammar and not even the elements of English composition. From this cause a great deal of drudgery falls upon the instructor in charge of this work. Careful inquiry shows that in some of the schools from which students are admitted on diploma little or no practice in original composition is required. In other cases, where pupils are hurried in their preparation for the University, they are excused from all rhetorical exercises. We respectfully urge that committees sent to inspect the schools be instructed to demand a reform in this particular.

Courses Two and Eight: Rhetoric. Conducted by Mr. Demmon. During the first semester a course in the Science of Rhetoric was given twice a week to a class of about fifty. The class completed David J. Hill's advanced treatise on the subject; and, in addition, each member was required to write and read two original essays. The essays were subjected to a careful criticism and revision by the instructor in the presence of the class, and in many instances private criticism and advice were given. In the second semester, this course was repeated with two sections of about forty each.

The aim in this course is to prepare the student for intelligent literary criticism, and to teach him the principles and methods upon which good writing and speaking rest. It is designed to follow the preceding course, and is required of all students for graduation.

Course Three: Extemporaneous Speaking. Conducted by Mr. Demmon.

A course was offered in this subject for the first semester. About forty-five elected it, and these were divided into three sections. Each section met once a week for two hours to discuss a question selected two weeks beforehand. Each discussion was opened with carefully prepared arguments by one on each side who had been designated for that purpose two weeks in advance. The other members were expected to speak to the question without notes. A member was selected from each section to preside and to render a written criticism and decision at the next meeting of the section. At the close of each exercise the instructor gave a criticism on the part each member had taken in the debate. All seemed to feel that they derived great profit from the course.

Course Four: Anglo-Saxon. Conducted by Mr. Demmon. For the first time in the history of the University, the department has been able to give instruction in this much neglected subject. A beginning was made the first semester by offering a course of one hour a week in Sweet's "Anglo-Saxon Reader." About forty chose the course and pursued it with much enthusiasm and success. Next year it is proposed to extend the course to two hours a week, and to follow it in the second semester with a course in the English of the Transitional Period.

Courses Five and Nine: English Literature. Introductory. Conducted by Mr. Tyler. These courses were taken by ninety students,—forty in the first semester and fifty in the second. The special object of this work is to enable the student to make a preliminary survey of the entire field of English Literature,—viewing the subject historically, biographically, and bibliographically, and doing this as a preparation to the direct reading of English Literature, as we aim to pursue it in the more advanced courses. The text-book used by us was Henry Morley's "First Sketch of English Literature;" a book which I have tried to adapt more perfectly to the wants of American students by a thorough revision and re-arrangement of it. In this form, the book is just published under the title of "A Manual of English Literature;" and it will furnish the basis for our studies in English Literature next year.

The introductory work contemplated in these two courses is a thing hard to preserve from becoming dry and tedious, on account of the vast extent of the period covered by English Literature, and of the multitude of dates, names, and titles included in it. I have hoped to overcome this difficulty, in part at least, by constantly directing attention to the men and the books and the epochs that are of highest importance; and also by presenting to the class, with the assistance of its own members specially appointed for the purpose, readings from many of the authors whose lives we study. I hope to succeed still further in overcoming the difficulty just referred to by some changes to be announced in the next Calendar. These changes involve the breaking up of the survey of English Literature into four parts, corresponding to these four periods,—Anglo-Saxon or First English, Transitional English, Early Modern English, and Modern English; and hereafter Courses five and nine are to be replaced by new Courses that will enable the student to master the history of English Literature in immediate connection with his study of that Literature itself.

Course Six: Study of Masterpieces. 'Conducted by Mr. Tyler. This course was elected by about sixty persons, who made a study of the following Masterpieces: — More's Utopia, Bacon's Essays, Milton's Areopagitica, Burke's Reflections on the French Revolution, De Quincey's Opium Eater, Book I. of Spencer's Faery Queen, Shakespeare's Sonnets, Milton's Paradise Lost, Pope's Dunciad, and Wordsworth's Excursion. The class was divided into three seminaries of about twelve members each; and each masterpiece was in its turn critically discussed, both orally and in writing, by each seminary, in an exercise lasting two hours; and the discussions of each Masterpiece were likewise reviewed and criticised by me in a lecture addressed to the class. This method of studying English Literature has proved very fruitful in interest and in advantage to those pursuing it.

Course Eleven. Study of Chaucer. Conducted by Mr. Tyler. This course was elected by about sixty students. The purpose of the course is to acquire the power of reading intelligently and fluently the entire works of Chaucer, and, by that means, of being able to read at sight any other writings belonging to the period of Early Modern English. The class used the Aldine edition of Chaucer. Our success was imperfect, owing to the small number of hours which we were able to assign to it—a defect that is to be remedied hereafter.

Course Twelve: Study of Shakespeare. This course was chosen by thirty-three students; and the work was done in seminaries, according to the same method as that pursued by the class in Course six. The following plays of Shakespeare were studied: Richard II., the two parts of Henry IV., Richard III., Twelfth Night, As You Like It, The Merchant of Venice, A Midsummer Night's Dream, Lear, Hamlet, Othello, and Macbeth.

NEW COURSES.

The Calendar for next year will show the establishment of the following new courses, of which the first is to be conducted by Mr. Demmon, and the others by myself:

(a) Transitional English or Semi-Saxon. (Text-book and Lectures.) (b) Modern English Literature. (Text-book and Lectures.) (c) English Literature with reference to its leading Types, in prose and verse. (Lectures.) (d) History of English Dramatic Literature. (Lectures.) (e) History of Journalism. (Lectures.) (f) American Literature. (Lectures.)

ELOCUTION.

The one branch of work which we are obliged to neglect is Elocution; and upon this subject I shall take the liberty of addressing to you hereafter a separate paper.

M. C. TYLER.

IX.—FROM THE PROFESSOR OF GEOLOGY IN CHARGE OF MINING ENGINEERING.

The geological department has been carried on during the past year, as in the years immediately preceding, under exceptionally unfavorable conditions. Some of the branches of study usually included under the term geology have received less than their proper share of attention, and a part of my time has had to be given to classes formed especially for the benefit of students in the School of Mines. This report, therefore, covers not only the work in geology, but also that in mineralogy and in mining engineering.

At the beginning of the year I announced for the first semester four courses of study in geology, and one in mineralogy; for the second second semester one course in geology, one in mineralogy, and one in mining engineering. Each course continued, excepting as stated below, during the whole of a semester. Course 1 in geology was really a course in physical geography. I met a class of five persons two days in the week, an hour each day. No single text-book was used. The subject was taken up by topics, and the class prepared for recitation by reading in the general library. I referred them principally to the works of Herschel, Guyot, Reclus, Thomson, and Maury, and to the more recent of the publications which give the results of systematic government explorations. I supplemented this reading by oral comment at the time of the recitations. In Course 2 in geology I had a class of twenty-five. Recitations were held three times a week. Dana's Manual of Geology was used as a text-book, those parts of the historical portion of the book which comprise the details of palaeontology being omitted. The course was known as structural geology. Course 3, known as economical geology, was taken by five students in the School of Mines. Instruction was given almost entirely by lectures. The original plan of continuing this course twice a week through the first semester had to be given up. It was given as a daily exercise for about six weeks in the first part of the second semester. Course 4, the Geology of the United States, was taken by only one person, but I felt bound to give the instruction on account of assurances given to the student before the close of the preceding year. We met twice a week for quiz upon the reports of the geological surveys which have been organized by the States or by the general government. The class in Course 5, numbering eighteen, used Le Conte's Elements of Geology as a text-book, reciting twice a week through the second semester. The chapters relating to dynamical and to structural geology were taken in full, but some of the historical portion was omitted.

The short course in mineralogy was intended principally for the seniors in the department of civil engineering, but three other students joined the class. The class met twice a week for the first semester. The long course comprised a daily exercise through the second semester. It was pursued by five students of the School of Mines and by one other. Both classes made free use of the collection of minerals purchased in 1876 as a part of the equipment of the School of Mines. I spent, as a rule, two hours with these classes at each of the appointed times for recitation and practical work.

Instruction in mining engineering was given by lecture during the second semester to the three students in the senior class of the School of Mines. The regularity of this course was interfered with a little by the change of the time allotted to the course in economical geology.

In addition to the work described above I gave in the first semester a course of eleven lectures in crystallography to the School of Pharmacy, each lecture with the subsequent practical work requiring about two hours of my time. Twenty-five students passed the examination at the end of the course.

W. H. PETTEE.

X.—FROM THE PROFESSOR OF GENERAL CHEMISTRY.

Agreeably to your request, I submit the following report of work for the past Academic year in the subjects of General Chemistry and Physics.

During the first semester my time was wholly occupied in giving instruction in the professional schools. During the second semester my work was in the Literary Department, and comprised three elective courses in general chemistry. Course 1 consisted of general and experimental lectures three times per week. Course 2 comprised general and experimental lectures followed by recitations five times a week. Course 3 was on the subjects of the kinetic theory of gases and on chemical philosophy. The last of these courses was intended chiefly for post-graduate students.

The numbers in attendance were as follows: Course 1, 68; Course 2, 33; Course 3, 10 (all from the Literary Department). Besides these there were many students from the professional schools in voluntary attendance.

It gives me pleasure to record a steady improvement, both in the quantity and quality of the work done by the students in these subjects. The means of illustration, such as apparatus and drawings, are also becoming better in consequence of appropriations made by the Regents from time to time; still our appliances for experimental illustration are very much below what are provided in many other universities, and the incessant advances of the physical sciences will render our efforts to teach them here properly more and more difficult, unless a liberal expenditure of money is made each year for apparatus.

In addition to the courses mentioned above, I have given instructions through the year in metallurgy to the students in mining engineering.

I am satisfied that there is an urgent demand from many students for some provision by which instruction in general chemistry may be given with more thoroughness than is possible under the lecture and recitation-room system alone. The laboratory system, where students may experiment for themselves, is the only way to meet this want. If there could be provided a laboratory where general, as distinguished from technical, chemistry could be taught, I am certain that the University of Michigan would offer facilities for the study of this science which are greatly needed, and which so far as I know are not generally accessible at other colleges.

JOHN W. LANGLEY.

XI.—FROM THE PROFESSOR OF ZOOLOGY.

I beg leave to present the following report of work done in Zoölogy during the past year.

When the new system of electives was adopted, five courses in Zoölogy were offered, all of them elective, and each of five hours per week, and extending through a semester.

Course 1 was intended for beginners, being a course in comparative anatomy and physiology, with Orton's Zoölogy as a text-book, and supplemental lectures. It was offered for the first semester and was elected by thirty-three students, chiefly from the first year's class.

The text-book used, though the best attainable, is not adapted to our work, and the course will be entirely of lectures during the coming year. Course 2 is also intended for beginners, and is a course of lectures in Systematic Zoölogy. Free use has been made of the duplicate collections in the Museum for illustrating this work, the specimens of each group being passed through the class, so that each member could handle and examine them.

This Course was offered for the first semester, and was elected by ninety-two students, who were pretty evenly distributed among the four classes.

The number of students choosing this Course was so large that the work could not be as well done as it should have been, but the same general plan will be followed during the coming year.

Course 3, offered also for the first semester, is an advanced course in the study of invertebrates, with the identification of species. It was elected by five students, who were, from excess of work in the department, left chiefly to the care of Mr. Higley, the assistant in the Museum. Those electing this course were allowed the free use of books from the University library, as most of the works needed were out of their reach by purchase. Most of their time was spent in the study of insects and shells, these being the groups most fully represented in our collections.

Course 4 was offered for the second semester, and was intended to be a course in the comparative anatomy of invertebrates, but was not elected by a sufficient number of students to justify its being given.

Course 5 was given during the second semester. It was a course in the identification and special study of vertebrates, and consisted of lectures and laboratory work. The tropical families of vertebrates represented in our Museum were studied, and some of the chief genera made out, but most of the laboratory work was in the identification of our own species.

The sets of bird skins belonging to the Museum, and already set aside for study, with the fresh specimens furnished by members of the class, were sufficient for our needs in that group; but our collections of native mammals, fishes and reptiles were found to be meagre.

Though this was the first time the Course had been given, from fifty to eighty species of birds were identified by each student, with twenty or thirty mammals and a number of fishes, amphibians and reptiles.

A supplemental course in microscopic study of blood, nervous, muscular and other tissues, was offered with this course in vertebrates, and, though no credit was given for the work, it was elected by over thirty of the class. It was necessary to do this work on Saturdays, in order to get the use of the microscopes.

Course 5 was elected by fifty-nine students.

I would respectfully call your attention to the following needs of the department of Zoölogy: It seems necessary to have a room large enough to accommodate the classes electing this study which shall belong especially to this department, and shall be filled with cases and drawers for the preservation of specimens used in illustration.

The room now occupied belongs equally to the department of Geology, and is also used for other purposes, thus making a large amount of labor in collecting and carrying back and forth the specimens used in teaching.

The department also needs a number of microscopes to make its work more effective, the microscopical laboratory being so fully occupied by students in botany and pharmacy as to leave no room for work in Zoölogy.

J. B. STEERE,

XII.—FROM THE ACTING PROFESSOR OF PHYSICS.

The following report of the work performed in the department of Physics during the year 1878-9 is respectfully submitted.

During the year six courses have been offered and given in Physics; in the first semester two courses were given, one requiring attendance five hours per week, two hours being devoted to experimental lectures, the remaining three to recitations on the lectures and on lessons assigned in Deschanel's Natural Philosophy: this course is substantially the same that has been given here for many years. The other, or "short" course, requires attendance at two lectures (not the same as those given in the "long" Course) and one review recitation weekly. In both courses the subjects of Mechanics of Solids, Liquids and Gases, Acoustics and Optics are discussed, while Heat and Electricity are taken up in the second semester by the

Professor of General Chemistry. In each Course there were during the last year about 45 students.

During the second semester the principal work is in the Physical Laboratory opened two years ago. Each year about 15 students have made use of this means of instruction, devoting two or three hours for three or five days a week. The plan followed is the one so successfully developed by Professor Pickering at the Massachusetts Institute of Technology and his book is used as a text-book. To give greater unity to the work, after performing each experiment the student makes a report of his results, and when a number of these reports on any subject have been handed in, they are put into the hands of some one of the students to be examined and compared: he makes a summary of the results and in a brief lecture before the class describes the object of the experiment, points out the important sources of inaccuracies, if there are any, in the particular apparatus used, and explains more or less fully more perfect ways of obtaining the results. In this way, among other things, the laws of falling bodies, of the pendulum, of lenses, of vibrating strings and of the deflection of iron, brass and wood bars have been verified, coefficients of friction measured, specific gravities found, the strength of wires determined, and familiarity gained with some methods of electrical and thermal measurement. Obviously the work is capable of indefinite extension, and a considerable addition to the apparatus for exact measurement is much needed for the advanced student.

During the last semester a course of thirteen lectures on Advanced Acoustics was given, devoted mainly to the development with experimental illustrations of the Physical Theory of Music at greater length than was possible in the general work in Acoustics. Six students took took this work. Lastly, a brief course of lectures describing simple apparatus, with suggestions to those intending to teach Physics, was followed by half a dozen students. For the coming year the same six courses will be offered and an additional one on Theoretical Physics.

Besides the work done in classes and already described, some work has been done in the Physical Laboratory by advanced students: one who obtained the degree of M. S. at the last Commencement presented a thesis on "Friction of Fluids," giving the results of a long experimental investigation and adding to previous knowledge on the subject.

In all the classes a good spirit has been shown and much excellent work has been done.

During the year some additions have been made to the cabinet of

Apparatus, including a Double Siren, an Appunn's Tonometer and a strong Rotating Apparatus.

In conclusion a few words may be said about the preparation in Physics of those students of whom an entrance examination on the subject is required. So large a proportion of those who come up for examination show such imperfect preparation that it has not yet been found practicable to give to those who have enjoyed good training all the advantages of the start thus gained. In some of the High Schools of the State the teaching of Physics is excellent; but there are not a few in which it is still considered sufficient if the pupil learns the words of a text-book. It cannot be too strongly impressed on teachers and school authorities that this is not teaching *science*, and that unless sufficient simple apparatus to illustrate and make perfectly clear the principal points in the book can be furnished, and time enough given to the teacher to prepare for the experiments, the pupil's time had better be given to other subjects, for he soon loses the knowledge of the words, and utterly fails to get that peculiar mental drill which only the scientific studies can give.

C. K. WEAD.

XIII.—FROM THE ASSISTANT PROFESSOR IN BOTANY.

At your request, I present herewith a statement of work done in the department of Botany during the past year.

During the first semester instruction in Cryptogamic Botany was given by a course of lectures accompanied by practical work in the microscopical laboratory. In this course a large part of the time was devoted to fungi and algae. The usual course of lectures on structural Botany accompanied by the study of crude drugs, etc., was given to the senior Pharmacy class during the first half of the year.

In the second semester the Course in elementary, structural and physiological botany was elected by about sixty students.

In the three courses already mentioned practical work with the microscope is required. The student is required to make accurate measurements, drawings and descriptions of the objects examined. The purpose is to teach him *how to investigate.* Mental discipline, skill in manipulation, and a somewhat critical knowledge of the main facts of plant structure and life are the results claimed for this method of work.

Much credit is due to Mrs. L. R. Stowell, Instructor in the microscopical laboratory, for the earnestness and skill with which she has prosecuted the work assigned her.

For two-fifths of the second semester daily recitations in Systematic Botany were held with a class from the Literary Department and with the junior Pharmacy class. In this part of the work analyses and written descriptions of plants accompanied by properly mounted herbarium specimens were required of every student.

This Course in Systematic Botany is no longer offered in the Literary Department, as there are now abundant opportunities for this work in all respectable preparatory schools, and accordingly it is now made one of the requirements for admission to the scientific course.

I hardly need remind you of the necessity of more assistance in the herbarium. During ths last vacation Miss E. C. Allmendinger has, without charge, devoted much time to mounting and preserving the dried specimens belonging to the University, and Prof. M. W. Harrington has also performed much gratuitous labor of the same kind upon plants which had been secured to the University through his instrumentality. There are some thousands of these still packed in boxes, of much value, but suffering for want of proper care. It is earnestly hoped that sufficient assistance may be provided by the Board of Regents for the completion, within a reasonable time, of the work of classification and mounting that still remains to be done.

VOLNEY M. SPALDING.

XVI.—POLITICAL ECONOMY AND INTERNATIONAL LAW.

Instruction in these branches is given by the President. In Political Economy we have an Elementary and an Advanced Course—both elective. In the former a text-book is used. The aim is to make the students familiar with the most important fundamental principles. In the Advanced Course notes are dictated and accompanied by full oral exposition and references to economic authorities. Themes for essays on economic subjects are also assigned. Special attention has been given to the problems of labor and of money.

The method of instruction in International Law is similar to that in the Advanced Course in Political Economy. The purpose is to acquaint the student with those principles of the Law of Nations which every educated man ought to understand. As an aid to the intelligent reading of history, or to preparation for responsible positions in society, this study has a value which entitles it to a place in a college curriculum.

APPENDIX C.

TABLE SHOWING THE NUMBER OF STUDENTS WHO HAVE COMPLETED THE COURSES ELECTED.

No. of Courses.	SUBJECTS.	No. of Students who have completed the Courses.	No. of recitations or lectures per week.
	GREEK.		
I	Lysias	62	4
II	Thucydides	63	3
III	Demosthenes	47	3
IV	Lyric Anthology	7	3
V	Teachers' Course	11	1
VI	Homer	60	4
VII	Sophocles	58	4
VIII	Theocritus	26	2
IX	Aristophanes, Plato	9	3
X	Teachers' Course	18	1
	LATIN.		
I	Terence	100	4
II	Quintilian	85	3
III	[Not taught last year]		
IV	Cicero	10	2
V	Pliny's Letters	9	2
VI	Teachers' Course	20	1
VII	Livy	94	4
VIII	Odes and Epodes, Horace	36	2
IX	Ars Poetica, Horace	69	3
X	Tacitus	24	3
XI	Lectures on Art	54	2
XII	Teachers' Course	13	1
	MATHEMATICS.		
I	Algebra	125	4
II	Gen. Geom. and Calculus	88	4
III	Advanced Calculus	6	5
IV	Determinants	11	1
V	Geometry and Trigon	118	4
VI	Gen. Geom. and Calculus	83	4
VII	Trilinear Coordinates	3	3
IX	Quaternions	8	1
X	Trigonometry	12	2
	GERMAN.		
I	Grammar and Reading	133	4
II	German Lyrics	24	5
III	Text-book. Plays	127	4
IV	Gœthe's Faust	31	2
V	German Literature	33	2
	FRENCH.		
I	Brachet, Grammar	91	4
II	Analysis and Translation	60	4
III	Molière, Racine	30	3
IV	Grammar—Readings	73	4
VI	Translations—Composition	46	4
VII	Taine's Art in Italy	80	3
	SPANISH.	30	2
	ENGLISH.		
I	Eng. Gram. and Speeches	39	2
II	Rhetoric	48	2
III	Extempore Speeches	41	1
IV	Anglo-Saxon	35	1
V	Engl. Lit., Introductory	87	3
VI	Masterpieces	82	3
VII	Grammar and Speeches	75	2
VIII	Rhetoric	64	2

No. of Courses.	SUBJECTS.	No. of Students who have completed the Courses.	No. of recitations or lectures per week.
IX	Engl. Lit., Introductory......	48	3
X	Chaucer	56	1
XI	Masterpieces........................	31	3
	HISTORY.		
I	General Hist. of England.....	35	2
II	Guizot—Civilization.	51	3
III	England since George III...	34	2
IV	Seminary work....................	18	2
VI	U. S. History.............	43	2
VII	History of Europe................	58	3
VIII	Rise of Prussia.....................	65	2
IX	England from Stuarts to George III........................	46	2
X	U. S. Political Hist.............	63	2
XII	U. S. Constitutional Hist......	16	2
	PHILOSOPHY.		
I	Psychology............................	30	2
II	Speculative Philosophy.......	55	5
III	Logic, Ethics......	50	2
IV	Historical Philosophy.........	34	5
	POLIT. ECONOMY.		
I	Text-book, Introductory......	54	2
II	Advanced, Lectures............	44	2
	INTERNATIONAL LAW.	51	2
	PHYSICS.		
I	Elementary—Experimental	55	3
II	Lectures and Recitations.....	40	5
III	Laboratory work...............	8	5
IV	....	6	3
V	Higher Acoustics.................	6	1
	GEN. CHEMISTRY.		
I	Experimental class..............	67	3
II	Lectures..............................	33	5
III	Chemical Philosophy.........	9	2
	ANAL. CHEMISTRY.		
I	Qualit. Analysis..................	10	8
II	Qualit. Analysis..................	8	4
III	Organic Chemistry..............	1	5
IV	Quant. Analysis......	10	3
VI	Physiological Chemistry......	7	5
VII	Organic Chemistry..............	5	3
VIII	Assaying	8	3
	MINERALOGY.		
I	Elements, (short course)......	12	2
II	Mineralogy and Lithology...	6	5

No. of Courses.	SUBJECTS.	No. of Students who have completed the Courses.	No. of recitations or lectures per week.
	GEOLOGY.		
I	Physical Geology................	5	2
II	Structural Geology..............	25	3
III	Economical Geology......... . .	5	2
IV	U. S. Geology......................	1	2
V	Lithology and Struct. Geol..	15	2
	ASTRONOMY.		
I	Theoretical Astronomy........	1	5
II	Descriptive Astronomy........	39	1
	ZOOLOGY.		
I	Comp. Physiol. and Zoölogy	30	5
II	Systematic Zoölogy.............	90	5
III	Invertebrates.......................	5	5
V	Identification of Vertebrates	57	5
	BOTANY.		
I	Cryptogamic Botany...........	3	5
III	Struct. and Physiol. Bot......	43	5
IV	Advanced do.	1	3
V	Systematic Botany...............	18	2
	DRAWING.		
I	Geometrical Drawing..........	19	2
II	Topogr. and Lettering........	9	2
IV	Descriptive Geometry..........	12	3
V	Shades and Perspective.......	6	3
VI	Free hand	38	3
VII	Free hand............................	1	3
VIII	Water-color Drawing..........	5	3
	SURVEYING.		
I	Transit and Level...............	7	3
II	Solar Compass.....................	3	2
III	Higher Surveying.........	5	5
IV	Field work, Railroads.........	6	4 w
	CIVIL ENGINEERING.		
I	Strength and Resistance......	11	2
II	Theory of Construction......	11	2
III	Truss Analysis....................	8	1
IV	Engineering Design............	8	5
V	Machine Drawing...............	16	2
VI	Prime Movers......................	11	3
VII	Analytical Mechanics.........	7	4
VIII	Theory of Construction......	7	4
IX	Hydraulics	8	5
X	Stereotomy	4	2
	MINING ENGINEERING.	3	5
	METALLURGY.	4	5

NOTE.—Some discrepancies may be observed between the number of students credited to Courses in this table and the numbers given by the Professors in Appendix B, This is due to the fact that the Professors have reported the full number in attendance. while this table, compiled from the Faculty records, gives the number who have completed their examinations.

APPENDIX D.

AN ACT making appropriations for the general and other expenses of the University of Michigan for the years eighteen hundred and seventy-nine and eighteen hundred and eighty.

SECTION 1. *The People of the State of Michigan enact,* That there shall be and is hereby appropriated out of the State Treasury, for the general expenses of the University of Michigan, and for other expenses and purposes herein named, the following sums, to wit:

For the General Library for the year eighteen hundred and sevty-nine, two thousand dollars.

For the General Library for the year eighteen hundred and eighty, two thousand dollars.

For the Hospital for the year eighteen hundred and seventy-nine, three thousand dollars.

For the Hospital for the year eighteen hundred and eighty, three thousand dollars.

For the Homœopathic College for the year eighteen hundred and seventy-nine, two thousand dollars.

For the Homœopathic College for the year eighteen hundred and eighty, the sum of two thousand dollars.

For the Dental College for the year eighteen hundred and seventy-nine, four thousand five hundred dollars.

For the Dental College for the year eighteen hundred and eighty four thousand five hundred dollars.

For credit to General Fund for Dental Buildings, thirty-two hundred and fifty dollars.

For Steam Heating Apparatus, twenty thousand dollars.

For building a Homœopathic Hospital, sixty-five hundred dollars.

For enlargement of Matron's House, one thousand dollars.

For the Homœopathic Hospital for the year eighteen hundred and eighty, twelve hundred and fifty dollars.

SECTION 2. There shall be assessed upon the taxable property of the State, in the year eighteen hundred and seventy-nine, the sum of forty-two thousand two hundred and fifty dollars, and in the year eighteen hundred and eighty, the further sum of twelve thousand seven hundred and fifty dollars, which shall be assessed, levied and collected in the same manner as other State taxes are by law assessed, levied and collected; which tax when collected shall be credited up to the general fund to reimburse the same for the amounts drawn therefrom as provided in section one of this act; and the Regents of the University are hereby required to make an annual itemized report to the Governor of all receipts and expenditures of the University: *Provided*, That no money shall be drawn from the State Treasury for the support of said University, unless the reports as required by this section, are made.

SECTION 3. This act shall take immediate effect.

Approved May 27, 1879.

UNIVERSITY OF MICHIGAN.

THE

PRESIDENT'S REPORT

TO THE

BOARD OF REGENTS

FOR

THE YEAR ENDING JUNE 30, 1880.

ANN ARBOR:
PUBLISHED BY THE UNIVERSITY.
1880.

ANN ARBOR PRINTING AND PUBLISHING COMPANY.

PRESIDENT'S ANNUAL REPORT.

To the Honorable Board of Regents:

In the absence of the President, who by your consent has accepted from the national government, for a limited period, the office of Minister to China, it becomes my duty as Acting President, to report the state of the University for the year ending June 30, 1880. It would doubtless have been extremely gratifying to the President to present to you in person the report for the year which has been by far the most prosperous in the history of the institution; the ninth year, too, of his own wise and able administration, marked by the steady advancement of the University in the great work for which it was organized, and giving abundant promise of still greater progress in the future. The year has been distinguished by largely increased attendance, by a decided improvement in all departments of the University in the standard of scholarship, and by uninterrupted order and harmony in all its internal working.

The Faculties, now embracing fifty-two officers of instruction, have remained nearly unchanged. Dr. Henry F. Lyster, appointed Lecturer on the Theory and Practice of Medicine during the absence of Professor Palmer, resigned prior to the opening of the first semester, and Professor Palmer, to whom leave of absence had been granted for a year, was recalled from Europe. Professor George S. Morris accepted a temporary appointment to fill the chair of Modern Languages during the absence of Professor Walter, who was permitted by the Board to spend the first semester in Paris. Hon. Alpheus Felch, ex-Governor of the State of Michigan, was appointed to the newly established Tappan Professorship of Law.

APPENDIX C.

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	LATIN.		
I	Terence	100	4
II	Quintilian	85	3
III	[Not taught last year]		
IV	Cicero	10	2
V	Pliny's Letters	9	2
VI	Teachers' Course	20	1
VII	Livy	94	4
VIII	Odes and Epodes, Horace	36	2
IX	Ars Poetica, Horace	69	3
X	Tacitus	24	3
XI	Lectures on Art	54	2
XII	Teachers' Course,	18	1
	MATHEMATICS.		
I	Algebra	125	4
II	Gen. Geom. and Calculus	83	4
III	Advanced Calculus	6	5
IV	Determinants	11	1
V	Geometry and Trigon	118	4
VI	Gen. Geom. and Calculus	83	4
VII	Trilinear Coordinates	3	3
IX	Quaternions	3	1
X	Trigonometry	12	2
	GERMAN.		
I	Grammar and Reading	134	4
II	German Lyrics	24	5
III	Text-book. Plays	127	4
IV	Gœthe's Faust	31	2
V	German Literature	33	2
	FRENCH.		
I	Brachet, Grammar	91	4
II	Analysis and Translation	60	4
III	Molière, Racine	30	3
IV	Grammar—Readings	78	4
VI	Translations—Composition	46	4
VII	Taine's Art in Italy	30	3
	SPANISH.	30	2
	ENGLISH.		
I	Eng. Gram. and Speeches	39	2
II	Rhetoric	48	2
III	Extempore Speeches	41	1
IV	Anglo-Saxon	35	1
V	Engl. Lit., Introductory	37	3
VI	Masterpieces	32	3
VII	Grammar and Speeches	75	2
VIII	Rhetoric	64	2

No. of Courses.	SUBJECTS.	No. of Students who have completed the Courses.	No. of recitations or lectures per week.
IX	Engl. Lit., Introductory	48	3
X	Chaucer	56	1
XI	Masterpieces	31	8
	HISTORY.		
I	General Hist. of England	85	2
II	Guizot—Civilization.	51	8
III	England since George III	34	2
IV	Seminary work	18	2
VI	U. S. History	48	2
VII	History of Europe	58	3
VIII	Rise of Prussia	65	2
IX	England from Stuarts to George III	46	2
X	U. S. Political Hist	63	2
XII	U. S. Constitutional Hist	16	2
	PHILOSOPHY.		
I	Psychology	30	2
II	Speculative Philosophy	55	5
III	Logic, Ethics	50	2
IV	Historical Philosophy	34	5
	POLIT. ECONOMY.		
I	Text-book, Introductory	54	2
II	Advanced, Lectures	44	2
	INTERNATIONAL LAW.	51	2
	PHYSICS.		
I	Elementary—Experimental	55	3
II	Lectures and Recitations	40	5
III	Laboratory work	8	5
IV		6	3
V	Higher Acoustics	6	1
	GEN. CHEMISTRY.		
I	Experimental class	67	3
II	Lectures	33	5
III	Chemical Philosophy	9	2
	ANAL. CHEMISTRY.		
I	Qualit. Analysis	10	8
II	Qualit. Analysis	8	4
III	Organic Chemistry	1	5
IV	Quant. Analysis	10	3
VI	Physiological Chemistry	7	5
VII	Organic Chemistry	5	3
VIII	Assaying	8	3
	MINERALOGY.		
I	Elements, (short course)	12	2
II	Mineralogy and Lithology	6	5

No. of Courses.	SUBJECTS.	No. of Students who have completed the Courses.	No. of recitations or lectures per week.
	GEOLOGY.		
I	Physical Geology	5	2
II	Structural Geology	25	3
III	Economical Geology	5	2
IV	U. S. Geology	1	2
V	Lithology and Struct. Geol.	15	2
	ASTRONOMY.		
I	Theoretical Astronomy	1	5
II	Descriptive Astronomy	39	1
	ZOOLOGY.		
I	Comp. Physiol. and Zoölogy	30	5
II	Systematic Zoölogy	90	5
III	Invertebrates	5	5
V	Identification of Vertebrates	57	5
	BOTANY.		
I	Cryptogamic Botany	3	5
III	Struct. and Physiol. Bot.	43	5
IV	Advanced do.	1	3
V	Systematic Botany	18	2
	DRAWING.		
I	Geometrical Drawing	19	2
II	Topogr. and Lettering	9	2
IV	Descriptive Geometry	12	3
V	Shades and Perspective	6	3
VI	Free hand	38	3
VII	Free hand	1	3
VIII	Water-color Drawing	5	3
	SURVEYING.		
I	Transit and Level	7	3
II	Solar Compass	3	2
III	Higher Surveying	5	5
IV	Field work, Railroads	6	4 w
	CIVIL ENGINEERING.		
I	Strength and Resistance	11	2
II	Theory of Construction	11	2
III	Truss Analysis	8	1
IV	Engineering Design	8	5
V	Machine Drawing	16	2
VI	Prime Movers	11	3
VII	Analytical Mechanics	7	4
VIII	Theory of Construction	7	4
IX	Hydraulics	8	5
X	Stereotomy	4	2
	MINING ENGINEERING.	3	5
	METALLURGY.	4	5

NOTE.—Some discrepancies may be observed between the number of students credited to Courses in this table and the numbers given by the Professors in Appendix B. This is due to the fact that the Professors have reported the full number in attendance, while this table, compiled from the Faculty records, gives the number who have completed their examinations.

non-classical studies on a footing of absolute equality, both in opportunities for acquirement and in rewards for successful attainment. I take occasion to emphasize this fact, because of the prevailing misapprehension which exists in this State and elsewhere as to the relative position held by the Ancient Languages in our educational plan.

Two facts are to be noted: first, that no one is compelled, in pursuing his education through the courses of study in the schools and the University, to spend any time whatever upon the classical languages; and, second, even if the student chooses the so-called classical course, the proportion of time actually devoted to classical studies in that course, is but a small fraction of the whole time given to his education. This can be demonstrated at once by reference to the plan of studies long established in our graded schools, in connection with that of the University.

A Michigan boy or girl, commencing with the Primary School, passing through the High School, and completing a course in the University for either of the four non-professional degrees, designated as Bachelors' degrees, spends, on the average, about sixteen years in the work of education.

Of the four plans of study established in the best organized High Schools, and connecting with each of the four plans in the University leading to these four degrees, one (leading to the degree of B. L.) admits *neither Latin nor Greek;* a second (leading to B. S.) requires in the High School an elementary course of about one year in Latin, as a preparation for the understanding of scientific terms, *but requires no Latin in the University;* a third (leading to the degree of B. L. Latin, or B. P.) requires Latin in the High School and University, but *no Greek;* and one (leading to the degree of B. A.) requires *both Latin and Greek* in the High School and University. Now, the percentages of time spent by our youth on the average in the studies of the Primary School and of these four courses or plans which follow the Primary in High School and University, that is, in the whole sixteen years of his education for the Bachelor's degree, are as follows:

	B. A.	B. L. (L.)	B. L.	B. S.
Mathematics	19	18	13	19
English	17	16	21	17
Modern Languages	0	10	13	8
Ancient Languages	22	10	0	2
History	2	2	3	4
Writing and Drawing	5	5	5	7
Sciences	9	12	15	30
Electives	24	25	28	11
Music	2	2	2	2
Totals	100	100	100	100

This table represents the percentages of time as arranged in the best schools of Michigan, combined with those of the University. That is, the youth who passes through school and University to the degree of Bachelor of Science, gives two per cent. of sixteen years to Latin, eight per cent. to Modern Languages, and all the rest of his time to English and scientific studies. The candidate for the degree of Bachelor of Letters in English, gives no time at all to Ancient Languages, thirteen per cent. to Modern Languages, and all the rest to English and scientific studies. The Bachelor of Letters in Latin gives ten per cent., that is a little more than one year and a half in sixteen, to Latin, the same to Modern Languages, and the rest of his time to English and scientific studies; unless he choose of his own preference to add more to his knowledge of Latin. Lastly, the Bachelor of Arts gives twenty-two per cent., or a little more than three years in the sixteen, to classical studies, with the privilege also of adding more to this kind of study if he prefer to do so. The remainder of his time, too, that is, a little less than thirteen years, is devoted to English and scientific studies, and, if he desire, to modern languages.

These facts show plainly enough that the complaint sometimes made, that an excessive amount of time is spent by the schools as well as by the University upon the classical studies, is entirely unfounded; and, also, that any deficiency which may exist in the education of our youth in the English Language and in scientific studies, cannot be attributed to undue attention to the Ancient Languages. We should also remember, and the fact, I apprehend, is not generally understood, that one half the time given nominally to the teaching of Latin and Greek, even in the classical courses, is in reality employed under good and true teachers, in the most practical and useful kind of study in English; for the labor of the class-room consists largely in severe and critical questions as to the usage of English words and phrases. Whatever complaint may be made of the one-sidedness of education in some of the schools and universities elsewhere, whatever complaint Jules Ferry may make of the excess of the classics in French education, it is evident that such censures have no application whatever to this region, and especially to Michigan. We are in no danger of too much literary culture here. In fact, these figures show that our inquiry should be, and that, too, with some solicitude, not what harm the "dead languages" are doing, but what becomes of the thirteen or sixteen years of the precious time of education given exclusively to English and scientific studies; and what kind of teaching is it which leaves our children and youth, after this large part of life devoted to these branches, so ignorant of them that there is no alternative in defence but to cry out that the classics are to blame? One might suspect that these things would be better learned and understood even if more time were given to the classics. It will be noticed that the period here mentioned of thirteen or sixteen years, devoted to non-classical studies, does not include our professional education, which would, if added, extend the period to sixteen or nineteen years.

That this subject may be still more distinctly presented, I append a table showing the proportions of time assigned to various studies in the University and the schools separately.*

The continuity of the studies in the local schools of the State and in the University, suggests a remark on the working of the plan of school visiting and inspection, adopted by the Literary Faculty ten years ago, and usually called "the diploma system." According to this plan, candidates for admission to the Literary Department, holding the diploma of any Michigan High School, which has been visited on the request of the School Board by an examining committee of the Faculty, and approved, is admitted to the University without examination. This innovation on old customs, like all innovations, and chiefly because it was an innovation, was met at once with severe criticism, and especially by some distinguished educators in the older colleges; fearing, as was alleged, that such a system would bring down the standard of scholarship. Experience, however, just as in the case of the admission of women to the University, an innovation made at the same period, has proved that there was no ground for fear, except that the thing was new, and not practiced in the mother colleges. Two facts are to be noted among the results: first, the standard of preparation in the High Schools, if affected at all, has been elevated rather than lowered; second, the State system of education has become a reality. It is obvious that there can be no system, properly so called, without an actual and living connection and communication among its members. By calling for the visiting or examining committees of the Faculty, the High Schools have been brought into that vital connection with the University which makes them parts of an actual organism, and, so far as concerns these schools, our State System no longer exists merely on paper.

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* Appendix A.

There are now sixteen of the most flourishing and important High Schools of the State holding this relation to the University; and no one can look into the condition of these schools without feeling satisfied that this connection has had the effect both to animate their students to more earnest effort, and to encourage and strengthen the teachers; while it has brought about a more perfect unity of plan and method in the schools of the State in general. In short, it gives to our schools, otherwise isolated, a bond of union and a centre of life. We are convinced, as the result of an experiment of ten years, that this cooperative plan, especially if entered into by the few remaining schools, and thus perfected, will give a character of consistency, solidity, strength, and efficiency to the educational work of the State, which will leave nothing further to be desired but the uninterrupted operation and movement of the system.

Nearly related to this subject is the question of the possible advancement of the Literary Department of the University from the condition of a German Gymnasium or French Lyceum, which it has occupied hitherto, in common with American Colleges generally, to that of a genuine university Department of Letters and Philosophy. The traditional usage of American Colleges, which closes up the work of education with the Bachelor's degree, and accustoms our youth to look upon that degree as the ultimate aim and end of all their studies, has left our liberal education very far below the proper standard, and notably below that of the German Universities. In other words, our Universities have given their strength chiefly to the work of secondary, instead of the higher education. How to make the needed transformation from this almost purely gymnasial work to that of the University proper, has been for some years the problem before the minds of university men.

It is manifestly difficult, if not impossible to change the Gymnasium into a University by merely building up a system of post-graduate courses, as a sort of annex to the old established curriculum of four years; for the post-graduate work will thus continue to be a mere subsidiary appendage, and the so-called Collegiate Department will still be the central and characteristic part of the institution. And, furthermore, the Bachelor's degree, conferred with imposing ceremonies upon the successive classes, will continue to be looked upon as the goal of educational work and the end of all perfection. I could almost venture to express the hope that the time will come when these Bachelors' degrees will even be abolished; and that instead of them, certificates of proficiency or maturity will be given, as in the German Gymnasium, to those who are prepared to enter upon the proper university studies preliminary to the Masters' and Doctors' degrees; especially since the Bachelors' degrees, in the multiplication of our Colleges and Universities, have been made so easy of acquisition that they have well-nigh lost all significance. Now, it seems to me that our close connection with the Public High Schools, and the continuity of the courses of study in the University with those of the schools, give us just the opportunity we need to initiate the proper university work, and to make the Masters' degrees gradually take the place of the Bachelors'. For the schools will certainly advance steadily, though slowly, in the grade of their attainments, and thus the university students, being better prepared in the schools, will be enabled so much the sooner to commence their work for the Master's degree. And it is just here, I think, that our new arrangement of studies in the University, which has been called "the new departure," comes in to facilitate the transformation which we desire. For it emancipates the student from the trammels of fixed courses at the period when he is sufficiently advanced in age and discipline, to choose and pursue his studies for himself as an individual, and according to his individual gifts, attainments, and necessities. And this is precisely the characteristic of university work for the Master's degree, as distinguished from gymnasial or lyceum work for the Bachelor's degree. It is probable that this freedom, or liberty of individual advancement, under the favorable circumstances I have spoken of, offering to the student so much encouragement to look beyond the Bachelor's degree, and to remain in the University until he can become a Master, will sooner or later throw the former into the shade, and make the Master's degree the aim of all the more talented and enterprising students. And this probability is strengthened by the constantly increasing number of candidates for the advanced degrees.

I think that every encouragement and incentive should be given to undergraduates to look upon this as the true end and aim of university studies. And thus, I trust, though some of us may not live to see it, that the secondary education may be placed where it belongs. Our Faculty should as soon as possible cease to expend all their time and strength on that which ought to be the work of the High School; thus compelling our more ambitious students to resort to foreign universities to obtain their higher education. For they should get their whole education at home. As one of the most intelligent and patriotic of ancient writers, the Younger Pliny, says, "Our youth should be educated in the land of their birth, resorting to the schools of their own country, and learning to love their native soil."

In connection with the statistics of the year it may be of interest to notice that in the attendance of women there was a slight increase over that of the previous year, while the proportion to the whole number of students was somewhat less. There were in the Department of Literature, Science, and the Arts, 81; Department of Medicine and Surgery, 43; Law Department, 1; Homœopathic Medical College, 8; School of Pharmacy, 2; Dental College, 3; total, 138.

Fifty-nine of the women in the Literary Department were candidates for degrees, as follows: Bachelor of Letters, 7; Bachelor of Science, 3; Bachelor of Letters (Latin), 21; Bachelor of Arts, 28; total, 59. There were 22 pursuing selected studies, and not candidates for degrees.

Of the fourteen hundred and thirty students in attendance, six hundred and forty-three were from Michigan; and of these, two hundred and fifty-one were in the Literary Department. Thirty-five other States were represented; most largely, Ohio, Illinois, New York, Indiana, and Pennsylvania. There were also students from England, Prussia, Japan, Burmah, Hawaii, the Bermudas, and the Provinces of Ontario, Quebec, and New Brunswick. The fees for matriculation and other purposes received from the seven hundred and eighty-seven students outside of the State, amounted to about $30,000.

In all the professional schools there has been an increase of attendance, excepting the Law Department, in which there was no material variation from the usual number. In the Department of Medicine and Surgery, the increase of numbers and the extension of the course to three years, with the accompanying division of the school into classes, will call for some modification of the present arrangement of lectures, the details of which must be determined by conference of the Faculty with the Board. The condition of the Department and its urgent wants are fully set forth in the Dean's report.

The Homœopathic College is gaining gradually in numbers. The question of an addition to its corps of professors must soon be considered; and perhaps such an addition, if attainable before the opening of another year, may be of advantage in relieving the burden of the Department of Medicine and Surgery.

The amphitheatres now connected with the hospitals of both Medical Schools, and the clinics, greatly multiplied by the number of patients resorting to both hospitals, have added immensely to the value of our medical education, while they have proved an inestimable boon to the sick and suffering from all parts of the State, as well as from abroad. The whole number of patients treated during the year, in both departments, was upwards of one thousand eight hundred.

The Law School, which of all the departments of the University, has from its organization, twenty-one years ago, to the present day, moved on with the least interruption and irregularity, and with the most perfect harmony, has passed through the year with its usual prosperity. The enlargement of its Faculty by the addition of a new chair, named after the first President of the University, the honored and venerable Dr. Henry P. Tappan, and the appointment to this chair of one of our most distinguished citizens and most eminent lawyers, the Hon. Alpheus Felch, have added greatly to the efficiency and usefulness of this department. An opportunity has thus been afforded to the Law students, especially to those of the first year, for daily class recitations and examinations, in addition to the usual course of lectures. It is to be regretted that the department, by the intrusion of the University Library, is still deprived of the use of a large portion of the building originally intended for its exclusive accommodation. I hope that the necessity for this kind of trespass will soon be removed. The Law Department needs all the space contained in the building, and even more. The earnest appeal on this subject, contained in the report of the Dean of the Law Faculty, I doubt not, will receive from the Board all that consideration which the urgency of the case demands. And I would remark here that the interests of the whole University, not less than those of the Law Department, make it imperative that new accommodations should be provided as speedily as possible for the General Library. The entire inadequacy of the apartment which it now occupies in the Law Building, the great disadvantage we are suffering in its use for the want of more room and a better location, will be brought to your attention by the Committee of the Faculties on the Library.

The interesting report of the Dean of the School of Pharmacy indicates the continued success of that department. The papers written by its professors and students have been published extensively, and quoted with approbation in the principal pharmaceutical journals of this country as well as those of England and Germany. To our School have been assigned for several years by the National Society of Pharmacy some of the most important subjects of investigation in chemical analysis, to be reported to that society; without any doubt, the industry and distinguished attainments of its officers, and the enthusiasm, success, and rapidly growing reputation of its graduates have given our School a position at least as high as that of the best Schools in this country. I bespeak your attention to the detailed report of the Dean of the Faculty; and also, as a kind of exponent of the high aims and success of the School, to the accompanying report of the Scientific publications of the Dean himself during the long period of his faithful service, and to the notice of a new method of chemical study originated by another professor of the school, taken from the *Chemical News* of London.

The Dental School continues to justify the provision made to the legislature for its organization and support. It is steadily growing, and its good service to the important profession which it represents, is already widely appreciated. In creating this School as well as that of Homœopathic Medicine, the Legislature undoubtedly did not intend to do its work by halves, and will continue to afford the necessary means not only for sustaining, but for strengthening both of these Faculties; so that both may do full justice to the responsible work which has been placed under their charge.

The University now possesses four Laboratories: that of

Analytical and Applied Chemistry, which is often styled by distinction "the Laboratory;" the Laboratory of General Chemistry, the Physiological Laboratory, and the Physical Laboratory. The work of the first two is carried on in the Laboratory building; the dimensions of which it has been found necessary to enlarge, in order to accommodate the increasing number of students. The work of the Physiological Laboratory is conducted in the Medical building, and the Physical Laboratory is connected with the lecture-room of the professor of Physics. The equipment of all the Laboratories has been much improved, and the work performed is greatly promoting the study of Science in these several branches.

Not the least interesting and important work of the University is that which comes under the designation of Microscopy. A large supply of instruments has been furnished to the students of Physiology, of Analytical Chemistry, and of Natural History. Their investigations under the direction of skillful microscopists, pursued with no little enthusiasm, have secured the good results which were anticipated; particularly, accuracy of observation and precision of knowledge.

The Astronomical Observatory will soon be in a condition, on the adjustment of the instruments received from Washington, to prepare students for the practical part of Astronomical study. The peculiar work of the Observatory, now, as heretofore, somewhat embarrassed by the want of a larger corps, is conducted with marked ability and success. The time and labor of the professor are devoted not less to instruction and lecturing in theoretical and general astronomy than to the work of the Observatory.

The General Library has within the last two years become even more important to the intellectual success of the University than ever before. The great change which has been introduced in the plan of instruction and method of study, have made the Library instead of the text-book, to a large extent, the apparatus for study and preparation for class-room examinations. The breadth and depth of scholarship, and I may say, the manhood, which this kind of investigation promotes, should be encouraged. To this end, greatly enlarged accomodations should be secured at the earliest possible moment. And for the same reason, as well as to meet the pressing wants of the members of all the Faculties, some more abundant means should be provided for the purchase of books. The small appropriations hitherto made for this object have not sufficed to keep the Library supplied even with the most important publications of the day. Meanwhile in every department of learning and letters there is a multitude of standard works, which are indispensable to thorough study and completeness of research, and which the Library can never possess without some special and extraordinary appropriations. It is much to be desired that the importance of a large and complete Library to the success of University work might be made more perfectly apparent. While experimental apparatus is requisite for the teaching of Physical Science, we should remember that books are the apparatus of the brain—the vital condition of real progress, whether in Philosophy, Science, Literature, or History. I doubt whether a University can be justly called great until it possesses an ample, if not a great Library. When the University of Strasburg was reorganized, on the recovery of Alsace to the German empire, in 1870, almost the first thing thought of by the public authorities was the creation of a Library. All Germany was appealed to for contributions of books, and institutions and citizens throughout the empire responded to the call. This, and not the erection of buildings, was reckoned the first necessity. I earnestly hope that the proposition to be made by the Library Committee of the Faculties, that a larger appropriation than usual be asked of the Legislature for this purpose by the Board, will meet with your approbation. I would also call your attention to the important statement contained in the report of Professor Adams on the same subject. For the wants of the current year I beg leave to suggest that an appropriation be made by the Board, not less than the usual amount, to supply the books needed for immediate use.

The Librarian reports the present state of the General

Library, and of other libraries in the University, as follows:

Number of volumes in General Library, 29,345; Law Library, 4,037; Society Libraries, 2,100; Library of Young Men's Christian Association, 1,000; total number of volumes accessible to students, 36.482; number of unbound volumes and pamphlets, 8,255.

Additions to the General Library, 1,882 volumes, and 301 pamphlets; to the Law Library, 100 volumes.

The Museum of Art and History has been enriched with the addition of a valuable collection of coins, mostly ancient, made by the gratuitous labors of Dr. A. E. Richards, one of the most accomplished numismatists of this country, formerly a citizen of this State, but now residing in Europe. Genuine antique coins are becoming daily more difficult to obtain, and, of course, more expensive; and the interest manifested by Dr. Richards in the University, which has led him to make this collection for its benefit, and thus to lay the foundation of a university museum of coins, deserves our most hearty acknowledgements.

The financial exhibit of the year is highly encouraging.* Never has so large an income been received from the students, and never, I think, has the income from all sources been appropriated to better advantage. But an institution like this can never receive an income adequate to its wants. The very fact which is taken as the best indication of prosperity, the increase of numbers, always increasing in the same ratio the demand for enlarged accommodations and additional instructors, dooms a University, and especially this University, to perpetual want. It is rich only in its students and its graduates. And it must hold up these before the State authorities—these, with its faithful efforts to do good service to the State, and to expend wisely the moneys committed to its trust, as the ground of appeal for continued sympathy, confidence, and support.

In the thirty-nine years since the doors of the institution were first opened, it has had under its instruction not less than *eight thousand students;* and now at the opening of a new year it has enrolled not less than *fourteen hundred and seventy*, and will probably register not less than fifteen hundred. Of all those who have been under our instruction, *six thousand one hundred and sixty-six* have been graduated. These numbers indicate, so far as numbers can, the work which has been accomplished.

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*Appendix D.

The expense of the State in sustaining the University thus far, including the appropriations of the last two years for building and other purposes, has been $570,000. The inventory just completed of the real estate and other property of the institution, gives us a valuation of $681,442; one hundred and ten thousand dollars in excess of the cost of the University to the State for nearly forty years. This excess, or balance, over and above the outlay of the State Treasury, is due partly to the donations of citizens and professors, but chiefly to the wise and skillful management of the Board of Regents in the use of the income which the University has received independently of the State.

If, therefore, our necessities, growing with our prosperity, compel us to look to the legislature for continued assistance, we can point to a record, as we think, of great success and usefulness in the host of youth we have helped to an education, and to a most faithful and even productive administration of our finances, as a just and reasonable argument for the continued generosity of the legislature.

Among the wants recognized by the University, in addition to that of a building for the General Library, is that of a gymnasium for the promotion of the physical development and health of the students. Physical training is necessary both to health and manhood. A sound mind without the sound body loses half of its efficiency. For several years our students have been active in cultivating field sports and athletic exercises, in order to compensate, to some extent, for the lack of a gymnasium. They have also been making earnest and commendable efforts to raise the funds necessary for the erection and equipment of a suitable building. But the opportunities within the reach of students for creating such a fund, are exceedingly limited; and they cannot hope, without assistance, to raise the requisite amount. The struggle which they are making deserves our hearty sympathy. It is said "the gods help those who help themselves." And the honorable legislature, they believe, will respond readily and generously to an application on the part of the Regents for an appropriation which, added to the amount obtained from various sources by the students themselves, will secure the building and the requisite apparatus.

In connection with improvements in building, will come up the question of the remodelling of the north wing of University Hall for miscellaneous purposes, after the collections now deposited there shall have been transferred to the new museum building. It is desirable that some plan for the new arrangement of the space should be adopted, and the necessary expense provided for.

The Deans of the Faculties of the professional schools, and the professors representing the various chairs in the Academic Faculty, have presented detailed reports of the work under their supervision, which will give an insight into the internal operations of the University during the year, and which are intended to accompany the President's report.* The reports of the professors, however, do not represent minutely the actual amount of labor necessarily involved in their work. I hardly need remark to the Board, that a lecture, or class exercise of any kind, exacts much greater outlay of time and strength than the hour devoted to the class. I append also a tabulated statement, prepared by the Secretary, of the studies pursued under the Academic Faculty, and of the number of students attending upon each.†

While we entertain just feelings of pride in the progress which this institution has made in the brief period of its existence, we must not close our eyes to its deficiencies. It still comes far short of the noble idea which was embodied in its original plan by the founders of the State and of the University. Their views were so comprehensive and complete that with all our endeavors we can scarcely hope in less than one more gen-

* Appendix C. † Appendix B.

eration at least, to reach the outside limit of their scheme. The idea which they left to our inheritance, and which embraced both the University and the whole body of public education, has become identified with the life and growth of the State. It is in substance this: That no son or daughter of Michigan shall be compelled to resort to any other State or country in order to acquire any knowledge or discipline necessary to the welfare of the citizen and of the State. Every educational want shall be provided for here at home, just as perfectly as if no other State nor any private institution were in existence. For the State has no right to expect its work to be done by any other State, much less by any private corporation. Nothing shall be left to chance, caprice, prejudice, or narrowness. The existence and happiness of the commonwealth require that every one of her children shall be guaranteed the opportunity of making the most and best of himself. Moreover, the State must protect itself from imposition, charlatanism, and quackery in the professions which deal with the interests of life and property; it must have safe and skillful physicians, and sound and trustworthy lawyers. Besides this, it must have well trained teachers for its youth; scientists who will enable it to understand and develop its natural resources; civil engineers and architects who will make buildings and bridges which will not imperil life; mining engineers who will render available its great mineral deposits—mining engineers, not trained in New York, or New Haven, but in Michigan, a mining State. And, finally, it must have sooner or later, those who will minister to life through the refining influences of art. For art, too, was included in the original plan of our education; and it is a want as real as any other which education supplies. Therefore, the State, for its own ultimate welfare, must maintain the whole circle of professional and practical schools.

All these things entered into the conception of public education entertained by our State fathers; and their idea, I think, is fixed and ineradicable in the constitution, and in the minds of the people. It is our privilege and duty to make this idea, so far at least as relates to the University, a reality. Under the good providence of God much has been accomplished; enough, indeed, to give us strong confidence in the final completion of the work.

In conclusion, I beg leave to congratulate the Board on the prosperous condition of the institution placed by the State under their supervision, and on the promise which it affords of an auspicious future.

HENRY S. FRIEZE,
Acting President.

APPENDIX A.

TABLES PREPARED BY ASSISTANT PROFESSOR BEMAN, OF THE UNIVERSITY, AND BY PROFESSOR PERRY, SUPERINTENDENT OF THE ANN ARBOR SCHOOLS, SHOWING THE PERCENTAGES OF TIME GIVEN TO THE STUDIES IN THE SEVERAL COURSES OF THE UNIVERSITY AND THE SCHOOLS.

The figures opposite the specified studies do not indicate all the time actually given to such studies, but simply all that is required. The student can at pleasure take more work in the same studies among the electives.

I. STUDIES IN THE UNIVERSITY.

B. A.	Hours.	Per Cent.
Greek	19	15.83
Latin	15	12.50
Mathematics	16	13.33
English	4	3.33
Philosophy	2	1.67
Physics	3	2.50
General Chemistry	3	2.50
Electives	58	48.33
Totals	120	100.00

B. L.	Hours.	Per Cent
Mathematics	2	1.54
French	16	12.31
German	17	13.08
English	10	7.69
Philosophy	2	1.54
Natural Sciences	10	7.69
Electives	73	56.15
Totals	130	100.00

B. L. (LATIN).	Hours.	Per Cent.
Latin	17	13.08
Mathematics	16	12.31
French	8	6.15
German	8	6.15
English	4	3.08
Philosophy	2	1.54
Physics	3	2.31
General Chemistry	3	2.31
Other Sciences	5	3.85
Electives	64	49.23
Totals	130	100.00

B. S.	Hours.	Per Cent
Mathematics	16	12.31
French	8	6.15
German	8	6.15
English	4	3.08
Philosophy	2	1.54
Physics	5	3.85
General Chemistry	5	3.84
Astronomy	3	2.31
Zoology	5	3.85
Botany	5	3.84
Drawing	5	3.85
History	5	3.84
Mineralogy	5	3.85
Laboratory, Phys. or Chem	5	3.84
Laboratory, Microscop.	5	3.85
Electives in Nat. Science	15	11.54
Unrestricted Electives	29	22.31
Totals	130	100.00

II. STUDIES IN THE PUBLIC SCHOOLS—INCLUDING THE PRIMARY AND ALL OTHER GRADES.

Studies.	Classical Course.	Latin Scientific Course.	Scientific Course.	English Course.
	Per Cent.	Per Cent.	Per Cent.	Per Cent.
English Language	30	30	31	35
Ancient Languages	16	8	4	0
Modern Languages	0	8	4	0
Mathematics	25	25	25	25
Natural Sciences	12	12	19	21
History	4	4	4	6
Writing and Drawing	10	10	10	10
Music	3	3	3	3
Totals	100	100	100	100

III. PERCENTAGES IN THE UNIVERSITY AND PUBLIC SCHOOLS COMBINED.

	B. A.	B. L. (L.)	B. L.	B. S.
Mathematics	19	18	13	19
English	17	16	21	17
Modern Languages	0	10	13	8
Ancient Languages	22	10	0	2
History	2	2	8	4
Writing and Drawing	5	5	5	7
Natural Sciences	9	12	15	30
Electives	24	25	28	11
Music	2	2	2	2
Totals	100	100	100	100

APPENDIX B.

TABLE SHOWING THE NUMBER OF STUDENTS IN THE VARIOUS COURSES AND PRESENT AT EXAMINATION.

No. of Course.	SUBJECTS.	No. of Students Present at Examination.	No. of Recitations a week.
	GREEK.		
I	Lysias	64	4
II	Thucydides	45	3
III	Demosthenes	47	3
IV	Plato; Lyric Anthology	10	3
V	Teachers' Course	15	1
VI	Homer	55	4
VIII	Lucian	26	2
IX	Aristotle; Aristophanes	9	3
X	Iliad; Philology	15	1
XI	Herodotus	6	2
XII	Sophocles	43	4
XIII	Greek Literature	71	1
XVI	Sophocles	7	4
	LATIN.		
I	Terence	92	4
II	Quintilian	81	4
III	Pliny's Letters	13	1
IV	Art Lectures	8	2
V	Teachers' Course	2	1
VI	Livy	89	4
VII	Horace (Odes and Epodes)	57	2
VIII	Ars Poetica; Juvenal	58	3
IX	Tacitus	15	3
X	Cicero's Tusculan Disputations	16	2
XI	Art Lectures	62	1
XII	Teachers' Course	24	1
XIV	Seneca	10	1
	SANSKRIT.		
I	Elements	7	2
II	Elements	3	1
	MATHEMATICS.		
I	Algebra	114	4
II & VI	Gen. Geom. and Calculus	78	4
III	Advanced Calculus	14	5
IV	Determinants	3	1
V	Geometry and Trigonometry	106	4
VII	Modern Geom. and Trilinear Co-ordinates	1	2
VIII	Quaternions	3	2
IX	Calculus of Variations	4	2
X	Trigonometry	6	2
XI	Analytical Mechanics	10	4
	FRENCH.		
I	Grammar	75	4
II	Idiomatic Analysis	63	4
III	Classics (Racine, Molière)	25	3
IV	Romantic Dramas	9	2
V	Grammar; Reading	63	4
VI	Idiomatic Analysis; Composition	44	4
VII	Literature—16th Century	9	3
VIII	Literature—19th Century	27	3
	GERMAN.		
I	Grammar	117	4
II	Iphigenie	68	5
III	Grammar	103	4
IV	Lessing's Laokoon	31	2
V	German Literature	12	2
VI	Faust	49	3
VII	Gothic (Ulfilas)	1	2
	ITALIAN.		
I	Grammar and Reading	35	2
	ENGLISH.		
I & VII	Grammar and Speeches	133	2
II & VIII	Rhetoric	60	2
IV	Anglo-Saxon	18	2
VI	Masterpieces	44	3
IX	Transitional Eng. period	17	2
X	Modern English period	64	2
XI	Shakespeare	27	3
XIV	English Drama	46	1
	HISTORY.		
I	Bright's Hist. of England	68	3

No. of Course.	SUBJECTS.	No. of Students Present at Examination.	No. of Recitations a week.
II	Guizot—Civilization	57	3
III	Polit. Hist. of England	39	2
IV	Seminary	31	2
VI	Hist. of America	66	2
VII	Continental Europe	25	3
IX	Wright's Hist. of England	65	3
X	Von Holst	47	2
XI	Government of England	133	2
XII	Seminary	30	3
XIV	Von Holst	18	2
	PHILOSOPHY.		
I	Psychology	84	2
II	Ethics; Spec. Philosophy	21	5
III	Logic	72	2
IV	Hist. of Philosophy	18	5
	SCIENCE AND ART OF TEACHING.		
I	Practical	31	2
II	Historical and Critical	74	2
	POLITICAL ECONOMY.		
I	Text-Book	84	2
II	Lectures	34	2
	INTERNATIONAL LAW.		
	Lectures	57	2
	PHYSICS.		
I	Short Course	47	3
II	Long Course	43	5
III	Laboratory Work	4	5
IV	Laboratory Work	9	3
VII	Theoretical Physics	1	2
VIII	Problems	9	1
	GENERAL CHEMISTRY.		
I	Experimental	50	8
II	Lectures and Experiments	39	5
III	Kinetic Theory of Gases	7	2
IV	Laboratory Methods	4	3
V	Laboratory Methods	8	5
	ANALYTICAL CHEMISTRY.		
I	Qualitative	13	10
V	Quantitative	10	7
Va	Quantitative	3	5
Vb	Quantitative	3	2
VIII	Physiological Chemistry	6	3
IX	Assaying—wet and dry	7	3
X	Blow Pipe Analysis	7	2
XII	Assaying—dry way	5	2
	MINERALOGY.		
I	Short Course	10	2
II	Full Course	2	5
	ASTRONOMY.		
I	Theoretical	1	5
II & VI	General Astronomy	27	3
III	Spherical and Practical	10	2
IV	Theoretical	2	5
V	Meteorology	6	2
	GEOLOGY.		
I & II	Facts and Doctrines—Oral Exercises	35	3
III	Palæontology	7	2
IV	Advanced Palæontology	1	5
V	General Geology	4	1
V & VI	General Geology and Oral Exercises	20	2
VII	Advanced Palæontology	2	5
VIII	Economic Geology	3	4
IX	Geology of U. S	1	2
	ZOOLOGY.		
I	Systematic	51	5
II	Invertebrates	2	5
III	Comparative	40	5
IV	Identification of Vertebrates	12	5
V	Entomology	10	8
VI	Advanced Course	2	5
	BOTANY.		
I	Cryptogamic	7	5
III	Structural	26	5
IV	Advanced Botany	4	8
	DRAWING.		
I	Geom. Drawing	16	2
II	Lettering and Topography	13	2
IV	Free-hand	38	3
V	Descriptive Geometry,	12	3
VI	Shades and Shadows	7	8
VII	Free-hand	14	3
VIII	Water-colors	2	2
	SURVEYING.		
I	Transit and Level	15	3
II	Solar Compass	14	2
III	Advanced Surveying	12	5
IV	Field work	8	*
	CIVIL ENGINEERING.		
I	Strength and Resistance	5	2
II	Theory of Construction	5	2
III	Graphical Analysis	3	1
IV	Engineering Design	2	5
V	Machine Drawing	10	2
VI	Machinery; Prime movers	5	3
VII	Applied Mechanics	14	1
VIII	Theory of Construction	2	4
IX	Hydraulics	2	1
X	Stereotomy	9	2
	METALLURGY.	7	8

* No regular time.

APPENDIX C.

REPORTS OF DEANS OF FACULTIES, AND OF THE PROFESSORS OF THE ACADEMIC FACULTY.

I.

THE DEPARTMENT OF LITERATURE, SCIENCE, AND THE ARTS.

FROM THE DEAN OF THE FACULTY.

The nature and amount of the instruction given within the past year in the Department of Literature, Science, and the Arts is explained in sufficient detail in the reports of the various Professors. One subject, however, of no little public interest, has received the attention of the Academic Faculty as a whole, and may, therefore, with propriety be reported upon by the Dean of the Faculty.

Under the so-called diploma-system, students who have completed their preparatory studies in those High Schools of Michigan which have been approved by special action of the Faculty, are admitted to the University without further examination. This system has now been in operation since the fall of 1871, a period of nine years.

It has seemed, on the whole, to work favorably, both for the University and the schools. In order, however, to ascertain more definitely what has been the degree of success obtained in the working of the system, a committee of the Faculty, consisting of Professors Pettee and Beman, was appointed in April last, to take into consideration the general subject of the standing in college of students admitted on diploma, compared with the standing of those admitted on examination.

As a preliminary step in the inquiry the committee collated and arranged in systematic form the results of the college examinations for the first year of all the students admitted to the several Freshman classes from the fall of 1871 to that of 1879, inclusive. It was not thought necessary to take into account the results of examinations in subsequent years. A year in college ought to be sufficient to obliterate distinctions, if any exist, arising from differences in the preparatory schools. The labor of arranging the results of the examinations was very great, involving a study of the records of more than one thousand different students, and the tabulation of the results of nearly ten thousand examinations. The tables which contain the detailed record have been so arranged by the committee as to show at a glance what examinations each student passed, and in what he failed or was in any way deficient.

From these tables of details, a careful summary was made for each semester of the nine years covered by the investigation. In these summaries the results of work done by diploma students are shown distinct from the results of the work of the students admitted on examination, and the percentage of success for each group of students is given. In addition to the summaries by semesters, tables were prepared to show the annual averages for each class of students, and a few other matters of interest bearing upon the general subject. The percentages of success were obtained by dividing the number of examinations successfully passed by the total number that, by the rules of the Faculty, ought to have been passed. From these tables of details and the summaries, the Committee have also compiled the tables printed below.

Students have been admitted on diploma from sixteen different schools. Table A below shows the actual average attendance of diploma students from each of these schools for each of the nine years during which the system has been in operation, and the average attendance of students admitted on examination for the same period. The fractions which appear in this table arise from the fact that an odd number of students left college at the end of the first semester, or that an odd number of students, who were not present the first semester, joined the classes of the second.

The percentages of success of the two great groups of students for each of the nine years, and the averages for the whole period, are given in Table B. It will be seen that the percentage is in favor of the students admitted on diploma.

In every year a greater or less number of matriculated students, who begin work in the several classes, are obliged to leave College before the end of the first semester; and others, after completing the work of the first semester, leave before the end of the year. Without inquiring at all into the causes of leaving, the committee compiled a table to show how far these removals from College affected the numbers of diploma students and of examination students, respectively, in their first college year. The result of this inquiry, given in Table C, is that a smaller percentage of the students admitted on diploma have left College than of those admitted on examination.

TABLE A,

SHOWING THE AVERAGE ATTENDANCE OF STUDENTS ADMITTED ON DIPLOMA AND OF STUDENTS ADMITTED ON EXAMINATION, FOR THE NINE YEARS, 1871-72 TO 1879-80.

	1871-72.	1872-73.	1873-74.	1874-75	1875-76.	1876-77.	1877-78.	1878-79.	1879-80.	Total.
Adrian	1	1	3½	....	1	....	....	....	....	6½
Ann Arbor	14	24	28	38½	37½	25	32	24½	29½	253
Battle Creek	....	....	....	....	2	1	2	2	....	7
Coldwater	....	....	2	4	1	4	2	1	2	16
Detroit	3	....	3	7	3	1	6½	10½	7	41
East Saginaw	....	....	....	....	....	....	....	....	7½	7½
Fenton	....	....	....	....	3½	1	2	1	3	10½
Flint	7	5½	2	1	1	1	2½	4	1	25
Grand Rapids	....	....	1	8	....	4	8	6	4½	26½
Jackson	7	3	5	1	....	4	3	2	....	25
Kalamazoo	3	1	....	....	....	....	....	....	....	4
Mich. Military Acad.	....	....	....	....	....	....	....	....	5	5
Niles	....	....	....	....	....	4	....	....	....	4
Pontiac	....	....	4	6½	3	4	2	5½	1½	26½
State Normal	....	....	....	....	....	....	1	....	....	1
Ypsilanti	....	....	8	1	....	1	....	1	....	11
Total Diploma	35	34½	56½	62	52	50	61	57½	61	469½
Examination	116	74½	53	42½	45	63	48	75	57½	574½
Total	151	109	109½	104½	97	113	109	132½	118½	1044

TABLE B,

SHOWING THE NUMBER OF STUDENTS IN ATTENDANCE AND THE AVERAGE PERCENTAGE OF SUCCESS, FOR THE NINE YEARS, 1871-72 TO 1879-80.

		1871-72.	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	1877-78.	1878-79.	1879-80.	Total.
Diploma.	In attendance	35	34½	56½	62	52	50	61	57½	61	469½
	Percentage of success	85.77	84.96	80.04	94.58	86.80	86.90	95.81	90.54	90.57	88.91
Examination.	In attendance	116	74½	53	42½	45	63	48	75	57½	574½
	Percentage of success	84.47	87.23	87.18	85.97	86.70	86.29	89.47	89.71	89.51	87.22

The cases of bad failure in college work are about equally divided between diploma and examination students. The basis of comparison adopted by the committee in investigating this phase of the subject was the more or less complete failure in three or more examinations in a single semester. Table D shows the number of these exceptionally bad failures for each group of students for each year. For the whole period of nine years, there were in the aggregate fifty-eight cases of bad failure among the diploma students, and seventy such cases among the examination students. To make the comparison just between the two groups of students, the proportion of bad failures relatively to the total amount of work reckoned by semesters, was ascertained. From the first of the above tables (A), it will be seen that the total attendance of diploma students for the nine years is 469½. Consequently the total work done by this class of students is represented by 939 semesters. In a similar way the work done by students admitted on examination will be found to amount to 1,149 semesters. Of these numbers, the fifty-eight and the seventy bad cases of failure are respectively 6.18 per cent. (for diploma students), and 6.09 per cent. (for examination students).

TABLE C,

SHOWING THE NUMBER OF STUDENTS WHO LEFT COLLEGE IN THE FRESHMAN YEAR, FOR THE NINE YEARS, 1871-72 TO 1879-80.

		1871-72.	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	1877-78	1878-79.	1879-80.	Total.	Per Cent.
Diploma.	Number enrolled in class..........	40	35	61	67	56	55	68	67	65	514	....
	Left before examinations of first semester..............................	3	......	4	4	2	4	5	7	2	31	6.03
	Left during second semester.....	4	1	1	2	4	2	4	4	3	25	4.86
Examination.	Number enrolled in class.........	123	92	68	49	53	64	60	79	59	647	....
	Left before examinations of first semester..............................	3	16	14	5	7	......	10	3	......	58	8.96
	Left during second semester.....	8	3	2	3	2	2	4	1	2	27	4.17

TABLE D,

SHOWING THE DISTRIBUTION OF THE CASES OF BAD FAILURE, FOR THE NINE YEARS, 1871-72 TO 1879-80.

	1871-72.	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	1877-78.	1878-79.	1879-80.	Total.	Per Cent.
Diploma..	5	6	16	3	9	10	2	1	6	58	6.18
Examination..	9	6	7	8	7	16	4	7	6	70	6.09

The tables prepared by the committee also throw a little light upon the practical working of the elective system; though the results of two years alone are too few to found any very broad generalization upon. Prior to the general introduction of the elective system the work of the Freshman year was so arranged that, as a rule, all students were required to do the same amount of work, viz., the equivalent of three exercises a day for five days in the week; or, expressed as it would be under the new system, fifteen hours a week. For the last two years a considerable freedom of choice in the election of studies has been allowed, and it thus becomes important to know which class of students has done, on the average, the greatest amount of work. As a partial answer to this question the following table is given.

TABLE E,

SHOWING THE NUMBER OF HOURS OF WORK ELECTED BY FRESHMEN, FOR THE TWO YEARS, 1878-79 AND 1879-80.

	1878-79.			1879-80.			Average for Two Years.
	1st Semester.	2d Semester.	Average.	1st Semester.	2d Semester.	Average.	
Diploma Students	15.52	15.73	15.63	15.55	15.40	15.4[illegible]	15.55
Examination Students	14.96	16.28	15.62	14.72	15.12	14.92	15.32
Twenty-one-Year Students	11.45	13.10	12.31	13.50	13.92	13.70	12.96
Total	14.49	15.49	14.99	11.83	15.02	14.93	14.96

An inspection of Tables E and B brings us to one other interesting conclusion. During the first seven years of the period under review, that is, before the adoption of the elective system, the attendance was regularly fifteen hours a week, and the percentage of success was, for diploma students, 88.36, for students admitted on examination, 86.50. During the past two years, that is, since the adoption of the elective system, the attendance has been, of diploma students, 15.55 hours a week, of students admitted on examination, 15.32; while for the same period the percentage of success has been, for diploma students, 90.56, and for students admitted on examination, 89.61. Thus it appears that although the number of hours taken by the students under the elective system is slightly greater than was the number taken under the old system, the percentage of success is also somewhat higher.

C. K. ADAMS.

FROM THE PROFESSORS OF THE DEPARTMENT.

1.—*FROM THE PROFESSOR OF THE LATIN LANGUAGE AND LITERATURE.*

The Courses offered for each semester were the following:

FIRST SEMESTER.

1. Terence; Latin Grammar; Latin Prose Composition. *Monday, Tuesday, Wednesday, Friday,* Sec. I., 2-3; Sec. II., 3-4; Sec. III., 4-5. ASST. PROF. ELISHA JONES.
2. Quintilian (10th Book); Odes of Horace; Lectures on Roman Literature. *Monday, Tuesday, Wednesday, Thursday,* Sec. I., 10½-11½; Sec. II., 11½-12½. PROF. FRIEZE.
3. Pliny's Letters. *Friday,* 10½-11½. PROF. FRIEZE.
4. Lectures on Classical Antiquities and Art. *Monday and Wednesday,* 3-4. PROF. FRIEZE.
5. Teachers' Course. *Friday,* 4-5. PROF. FRIEZE.

SECOND SEMESTER.

6. Livy; Satires of Horace. *Monday, Tuesday, Wednesday, Friday,* Sec. I., 2-3; Sec. II., 3-4; Sec. III., 4-5. ASST. PROF. ELISHA JONES.
7. Odes and Epodes of Horace. *Tuesday and Thursday,* 10½-11½. PROF. FRIEZE.
8. Horace (Ars Poetica); Juvenal. *Monday, Wednesday, Friday,* Sec. I., 9½-10½; Sec. II., 10½-11½. ASST. PROF. ELISHA JONES.
9. Tacitus (Germania and Agricola). *Monday, Wednesday, Friday,* 10½-11½. PROF. FRIEZE.
10. Cicero's Tusculan Disputations. *Tuesday and Thursday,* 11½-12½. PROF. FRIEZE.
11. Lectures on Classical Antiquities and Art. *Wednesday,* 3-4. PROF. FRIEZE.
12. Teachers' Course. *Friday,* 4-5. PROF. FRIEZE.
14. Essays of Seneca. PROF. FRIEZE.

From this schedule it will be perceived that the Professor of Latin devoted to lectures and recitations thirteen hours a week during the first semester and ten during the second, or an average of two to three hours daily during the year; and that the Assistant Professor devoted twelve hours to recitations during the first, and eighteen during the second semester, or an average of three hours a day during the year.

The following table shows the number of students in attendance on each of the above-mentioned Courses:

1	98
2	81
3	13
4	21
5	24
6	93
7	57
8	68
9	15
10	16
11	75
12	14
14	41
Total	616

The Courses numbered 1 and 6 were conducted wholly by recitation. The Latin text was translated and the exercise was accompanied by grammatical analysis, composition, and a considerable amount of collateral study in history and antiquities.

In the other Courses, except the lectures on classical antiquities and art, it was the principal aim of the instructor to lead the students to a complete understanding and appreciation of the author, in respect to subject-matter and literary excellence, rather than to make the text a basis for the study of the grammar. To this end the exercises of the class-room consisted largely of annotations and exegesis, with occasional lectures on Roman literature and history.

The work of the students has been done in general with much earnestness and with commendable success, which is due in some measure, at least, to the exercise of a reasonable amount of liberty in the choice of studies.

H. S. FRIEZE.

II.—FROM THE PROFESSOR OF MATHEMATICS.

I submit the following report of work done in the department of Pure Mathematics during the academic year 1879–80.

COURSES OFFERED.

FIRST SEMESTER.

1. Advanced Algebra. *Four times a week.* Asst. Prof. C. N. Jones and Asst. Prof. Beman.
2. General Geometry and Calculus. *Four times a week.* Prof. Olney and Asst. Prof. Beman.

3. Advanced General Geometry and Calculus. *Five times a week* PROF. OLNEY.

4. Determinants. *Once a week.* ASST. PROF. C. N. JONES.

10. Trigonometry. *Twice a week.* ASST. PROF. BEMAN.

SECOND SEMESTER.

5. Advanced Geometry; Plane and Spherical Trigonometry. *Four times a week.* ASST. PROF. C. N. JONES.

6. General Geometry and Calculus. *Four times a week.* PROF. OLNEY and ASST. PROF. BEMAN.

7. Modern Geometry and Trilinear Coordinates. *Twice a week.* Asst PROF. BEMAN.

8 Calculus of Variations. *Twice a week, first half of semester.* PROF. OLNEY.

9. Quaternions. *Twice a week, second half of semester.* PROF. OLNEY

11. Analytical Mechanics. *Four times a week.* ASST. PROF. C. N. JONES

Professor Jones's work was as follows: *First semester*: 4 sections in Course 1, numbering in all 110 students; Course 4, 3 students; in all 17 hours a week for the Professor. *Second semester*: 4 sections, Course 5, 90 students; Course 11, 13 students; in all, 20 hours a week for the Professor.

Professor Beman's work was as follows: *First semester*: Course 10, 6 students; Course 1, 19 students; 4 sections, Course 2, 78 students; in all, 14 hours a week for the Professor. *Second semester*: Course 7, 1 student; Course 5, 16 students; 4 sections, Course 6, 78 students; in all, 14 hours a week for the Professor.

Professor Olney's work was: 4 sections, Courses 2 and 6, throughout the year, each twice a week, 80 students. *First semester:* Course 3, 5 times a week, 18 students. *Second semester*: twice a week in Courses 8 and 9, 6 students; in all, 13 hours a week the first semester, and 10 the second. The number of hours a week the second semester was exceptionally small, in consequence of inability to divide Courses 2 and 6 into as many sections as there should have been.

The amount of Professor Jones's work, as will be seen, was simply intolerable. The Board has very wisely given him relief for the ensuing year, which, I hope, will add greatly to the efficiency of the instruction. The work in the department is considerably in excess of that done last year, both as regards the number of students and the range of subjects.

It is proposed to add a two years' course of Mathematical reading, as soon as there shall be a sufficient demand for it, in such standard works as Salmon's Higher Algebra, Frost's Solid Geometry, Dostor' Determinants, Todhunter's or Price's Integral Calculus, and Tait Quaternions.

The above statement of work does not include examinations,
əneral or special, and the general oversight of the work, which at
me periods is no inconsiderable part of of the duties of the Professor
charge.

EDWARD OLNEY.

III.—FROM THE PROFESSOR OF HISTORY.

I beg leave to present the following account of the work in His-
ry during the academic year, 1879–80.

As in previous years, the studies in Ancient History were con-
ucted under the direction of the Professors of Greek and Latin, and
erefore hardly come under the cognizance of this department.

The instruction in Modern History has had three objects in view:
rst, the general history of Europe from the fall of the Roman
mpire to the French Revolution; second, the more careful study of
e political and constitutional history of England; and third, a
orough study of the political and constitutional history of the
nited States. The work done for the accomplishment of these sev-
al objects was as follows:

1. In the first semester a course of lectures was given on the
stitutions of the Middle Ages. The lectures were thirty-two in num-
r, and their purpose was to show at once the course and the mean-
g of events from the beginning of the barbarian invasions to the
me of the renaissance. At the conclusion of this course of lectures,
d supplementary to them, Guizot's History of Civilization in Europe
as used as a text-book. The number of students taking this course
as fifty-seven.

In the second semester the general history of Europe was contin-
d three hours a week, the text-book used being Professor C. D.
onge's Three Centuries of Modern History. The course embraced
e whole period treated by the author and extended from the Revival
Learning to the outbreak of the French Revolution. The number
students in the class was twenty-six.

2. The instruction given in the history of England had four some-
hat distinct purposes in view: first, a knowledge of the principal
ents of English history; second, a careful study of the constitu-
nal history of England; third, the political history of England
ring the present century; and fourth, the theories and methods
the English Government. For the accomplishment of these pur-
ses, the following courses of instruction were given:

Three hours a week during the first semester on the general his-
ry of England from the accession of the House of Tudor to the over-

throw of the Stuarts. The text-book used was Bright's History of England. The number of students taking the course was sixty-eight. In the second semester, the course was continued from the overthrow of the Stuarts to the close of the Napoleonic wars. Volume III. of the same work was used as a text-book. The number of students in the class was sixty-five.

The constitutional history of England was studied in the Historical Seminary. The class contained none but students of advanced standing, several of the number being candidates for a second degree. No one text-book was assigned, and no lectures were discussed, but topics with large numbers of references were given, and investigation of each subject assigned was required of each member of the class. The class was divided into three sections, each section holding a session of two hours each week. The number of students in the class was thirty-four.

On the political history of England since the fall of Napoleon I. a course of two lectures a week was given during the first semester. The number of students in this course was thirty-nine.

A course of two lectures a week was given during the second semester on the theories and methods of the English Government, and was elected by a hundred and fifty-two students.

3. Four courses were likewise given on the History of the United States, viz.:

A course of two lessons a week on the political history of America from the settlement at Jamestown to the adoption of the Articles of Confederation. Eliot's History of the United States was used as the text-book. The class contained sixty-six members.

An advanced course in the constitutional history of the United States, volume I. of von Holst being used as the text-book. The lessons of the class were two a week, and the class numbered forty-seven.

Another class used the second volume of the same work during one semester. The lessons were two a week, and the number in the class was nineteen.

The political history of the United States was also studied in the Historical Seminary. The class was divided into small sections for historical investigation; and each student was with the professor three hours a week. Only students who had already completed the other work in United States History were admitted to the class. The number of students in the course was thirty.

The following tabular form will show at a glance the number of students in the courses in History.

1.	History of England, 1485–1688, (Asst. Prof. Hudson)	68
2.	Middle Ages, Lectures, (Prof. Adams)	57
3.	England Since 1815, Lectures, (Prof. Adams)	39
4.	English Constitutional History, (Prof. Adams)	34
6.	Political History of the Colonial Period, (Asst. Prof. Hudson)	66
7.	General History of Europe, (Asst. Prof. Hudson)	26
9.	History of England, 1688–1815, (Asst. Prof. Hudson)	65
10.	Constitutional History of the United States, 1789–1817, (Asst. Prof. Hudson)	47
11.	The Government of England, Lectures, (Prof. Adams)	152
12.	Political History of the United States, (Prof. Adams)	30
14.	Constitutional History of the United States, 1817–1852, (Asst. Prof. Hudson)	19
	Total number in Historical classes	603

I desire to call your attention to the inadequacy of the University Library for the wants of the students of history.

The following table has been made up by the Assistant Librarian, for the purpose of showing the number of works drawn by students in the several departments of study. Each column represents the number of books drawn for one week. The seven columns, therefore, show the number of works drawn in as many different weeks, the weeks having been taken at random in the course of the last five years. The week in the first column was in October 1874; that in the last, in May, 1880. It is supposed that the proportions fairly represent the average use of the library in the several branches classified:

History	296	268	288	353	424	296	289
English Literature	97		78	214	316	277	167
Ancient and Modern Languages	42	60	40	69	126	115	103
Political Economy	16	52	25	19	43	41	9
Philosophy	52	7	36	39	37	18	24
All the Sciences	55	60	63	102	163	84	129

This table shows that in the seven weeks (selected at random) the whole number of books drawn was 4,993, and that of this number 2,214 were on the subject of history, while the number drawn on all other subjects combined was 2,779. An inspection of the table will further show that previous to 1878, when the Seminary method of work was adopted in English Literature, the number of works drawn on historical subjects exceeded by many the works drawn on all other subjects combined.

Attention is called to this fact for the purpose of raising the question whether some provision ought not to be made by which the supply of historical books in the library can be increased. According to the system long since adopted for the selection of books to be purchased, the head of each department is invited by the Library Committee to furnish a list of books needed in his department. The lists so furnished represent books of a certain aggregate value, varying from fifty to one hundred dollars each. Of these lists the department of History furnishes one; English Literature, one; Languages, three; Political Economy, one; Philosophy, one; the Sciences, ten. For some years past the books recommended on these special lists have very nearly exhausted the appropriation available after paying for the periodicals and the binding. The consequence has been that the Library Committee has found it impossible to add very largely to any of the lists. On this account the department of History has suffered especial inconvenience. The figures above given indicate that of all the books drawn from the library during the past six years, nearly one half have been on the subjects of history; while of the lists of books to be purchased, the Chair of History is entitled to recommend only one seventeenth. The result is that in some of the important branches of history no contributions have been made to the library in several years.

It is only within very recent time that the History of the United States has received in this University any very considerable attention. A number of courses are now offered, but the resources of the library are entirely inadequate to the giving of successful instruction. Attention is called to this fact in the hope that the question will at least be considered whether an especial appropriation for the purchase of books on American History may not with propriety be asked for.

C. K. ADAMS.

IV.—FROM THE PROFESSOR OF MENTAL AND MORAL PHILOSOPHY.

The Professor of Mental and Moral Philosophy respectfully reports that the subjects embraced in his department of instruction have been as follows:

1. Psychology.
2. Logic.
3. Ethics.
4. Speculative Philosophy, Rational Psychology, Rational Cosmology, and Rational Theology (Natural Theology).
5. History of Philosophy.
6. Evidences of Christianity.

The only required study is *Psychology;* the rest are optional.

The time devoted to each subject is indicated below.

FIRST SEMESTER.

Lectures on Speculative Philosophy (including a short course on the fundamental postulates of Ethics), 5 hours a week.

Lectures and recitations in Psychology (2 sections), 4 hours a week.

The students in Speculative Philosophy wrote theses on topics assigned them by the Professor.

SECOND SEMESTER.

Text-book recitations in the History of Philosophy, 5 hours a week.

Recitations in Logic (2 sections), 4 hours a week.

The Lectures on the Evidences of Christianity were omitted last year (the only time they have been omitted for the past 11 years) in consequence of the sickness of the Professor, who was granted leave of absence by the Regents before the end of the College year.

The number in attendance upon the several courses was as follows:

Speculative Philosophy	23
History of Philosophy	22
Psychology	90
Logic	71
Total	206

B. F. COCKER.

V.—FROM THE PROFESSOR OF APPLIED CHEMISTRY.

The organization of the instruction in Analytical and Applied Chemistry, for the year 1879–80, has remained very nearly unchanged from the preceding year, as presented with details under the last report of the President. A tabulated statement of the hours and duration of each Course of study, of the number of students of each University department in attendance in each Course, and of the duties of each Instructor, is presented below.

Last year I urged the need of a decided increase in the works on Chemistry in the General Library, and I can only repeat that, for the suitable encouragement of original research, in this department as in others, we want a considerable expenditure for books.

The number of students in the Laboratory has been such as to place an average of from thirty-four to forty under the daily instruction of each of the regular teachers.

Studies.	Number of Students.	Exercises a week.*	Duration of Course.
DEPARTMENT OF LITERATURE, SCIENCE, AND THE ARTS	28		One Semester
(Studies in Analytical Chemistry, all elective)			
Qualitative Analysis—(Course 1). ASST. PROF. JOHNSON	14		
Recitations		5	
Laboratory work		5	
Quantitative Analysis—(Course 5). MR. CHEEVER	14		
Lectures		2	
Laboratory work		5	
Physiological Chemistry—(Course 8). ASST. PROF. ROSE	5		
Laboratory work		5	
Assaying of Ores—(Course 9). MR. CHEEVER	5	8	
(Course 12)	5	2	
Blow-pipe Analysis—(Course 10). MR. CHEEVER	6	2	
Original Investigations—(Course 11). PROF. PRESCOTT	8	5	
DEPARTMENT OF MEDICINE AND SURGERY, HOMŒOPATHIC MEDICAL COLLEGE, DENTAL COLLEGE,	300		Seven weeks
Qualitative Chemistry. DR. VAUGHAN, ASSISTED BY MR. THUM.	209		
Lectures and class-drills		5	
Laboratory work		5	
Physiological Chemistry. ASST. PROF. ROSE			
Medical requirement: Lectures	154	3	
Laboratory work		5	
Dental requirement: Laboratory work	16	5	8 weeks
Advanced Course: Laboratory work	1		20 weeks
Toxicology. Laboratory and Lectures. ASST. PROF. ROSE.	6	5	7 weeks
SCHOOL OF PHARMACY—(Studies all required)	85		
Qualitative Analysis. ASST. PROF. JOHNSON	42		22 weeks
Recitations		5	
Laboratory work		5	
Quantitative Analysis. MR. CHEEVER	35		14 weeks
(Two successive sections)			
Lectures		3	
Laboratory work		5	
Pharmaceutical Preparations. PROF. PRESCOTT, ASSISTED BY MR. IRWIN. (Two successive sections).	27		12 weeks
Laboratory work (class instruction in the Pharmacy lectures)		5	
Toxicology. ASST. PROF. ROSE	33		6 weeks
Laboratory work		[illegible]	
Lectures		2	
Physiological Chemistry. ASST. PROF. ROSE	30		6 weeks
Laboratory work		5	
Lectures		3	
Organic Analysis. Laboratory. DR. VAUGHAN	27	5	6 weeks
(Class instruction in PROF. PRESCOTT'S Pharmacy lectures).			
Original Investigations. PROF. PRESCOTT	24	5	5 to 10 weeks.
FROM ALL DEPARTMENTS. In laboratory work of Analytical and Applied Chemistry, during 1879–80	418		
In 1878–9	374		
In 1877–8	251		

* Each exercise in the Laboratory requires two to three hours' work. Recitations and lectures continue one hour.

ALBERT B. PRESCOTT.

VI.—FROM THE PROFESSOR OF THE GREEK LANGUAGE AND LITERATURE.

I have the honor to present the following report of the work done in the department of Greek, for the academic year 1879–80:

FIRST SEMESTER.

Course 1 (required). Lysias and Athenian History; with Asst. Prof. Pattengill, four times a week; sixty-five students, in two sections.

Course 2 (required). Thucydides; with Asst. Prof. Pattengill, three times a week; forty-five students, in two sections.

Course 3 (required). Demosthenes on the Crown and Lectures on the Greek Orators; given by Prof. D'Ooge, three times a week; fifty-two students, in two sections.

Course 4 (elective). Plato's Gorgias, selections from the Lyric Anthology, and the Medea of Euripides; read with Prof. D'Ooge, three times a week; eleven students.

Course 5 (elective). Lectures on Greek Grammar and on methods of teaching Greek; by Prof. D'Ooge, once a week; seventeen students.

Course 11 (elective). The Seventh Book of Herodotus; read with Prof. D'Ooge, twice a week; six students.

SECOND SEMESTER.

Course 6 (required). The Odyssey (Sixth Book); with Asst. Prof. Pattengill, four times a week; fifty-six students, in two sections.

Course 7 (required). The Antigone of Sophocles and the Birds of Aristophanes; with Prof. D'Ooge, four times a week; seven students.

Course 8 (elective). Selections from Lucian; with Asst. Prof. Pattengill, twice a week; twenty-nine students.

Course 9 (elective). Selections from the Ethics of Aristotle, the Acharnians of Aristophanes, Lectures on the Greek Drama; given by Prof. D'Ooge, three times a week; ten students.

Course 10 (elective). Teachers' class in Greek Prose Composition; with Prof. D'Ooge, once a week; sixteen students.

Course 12 (required as a substitute for *Course* 7). The Electra of Sophocles, and the Frogs of Aristophanes; with Asst. Prof. Pattengill, four times a week; forty-five students.

Course 13 (required). History of Greek Literature and Art, with Lectures; by Prof. D'Ooge, once a week; seventy-six students.

From an examination of these statements it will appear that the entire number of students enrolled in all the courses in Greek was 196 in the first, and 239 in the second semester, or a total of 435 for the year, which is an increase over the number of last year, and the largest number in the history of the University. Of this number 89 are enrolled in elective courses.

In addition to the courses already named, I have spent during the second semester about two hours a week with a student who was reading privately and pursuing advanced courses. One candidate for the Master's degree, Mr. A. W. Burnett, presented a thesis in this department, entitled "The Character and Influence of the Old Athenian Comedy."

Finally, I desire to bear witness to the valuable work of the Assistant Professor, to whose growing efficiency and influence the prosperity of this department is in no small degree indebted.

MARTIN L. D'OOGE.

VII.—FROM THE PROFESSOR OF CIVIL ENGINEERING.

The work in the department of Civil Engineering for the past year has been under the charge of the same instructors as were enumerated in the report for the preceding year, and the scope and character of the instruction have been essentially unchanged. The Courses given in each semester, the number of exercises a week in each Course, the name of the teacher and the number of students in attendance, were as follows:

FIRST SEMESTER.

Course.	Subject.	Weekly Exercises.	Instructor.	No. of Students.
1. Drawing................	Geometrical Drawing........................	2	Asst. Prof. Davis	16
2. Drawing................	Topographical Drawing. Lettering, etc	[illegible]	Mr. Denison......	13
4. Drawing................	Free-hand Drawing, pen and ink.......	8	Mr. Denison	31
1. Surveying..............	Transit and Level	8	Asst. Prof. Davis	15
2. Surveying..............	Compass, Solar Compass, U. S Surveys	2	Asst. Prof. Davis	14
1. Civil Engineering...	Strength and Resistance of Materials...	2	Prof Greene......	5
2. Civil Engineering ..	Theory of Construction.......................	2	Prof. Greene.......	5
3. Civil Engineering...	Graphical Analysis of Structure	1	Prof. Greene.......	8
4. Civil Engineering...	Engineering Design..............................	5	Prof. Greene	2
5. Civil Engineering...	Mechanism and Machine Drawing......	2	Mr. Denison.......	11
6. Civil Engineering...	Machinery and Prime Movers, Water-Wheels, and Steam Engine	8	Prof. Greene.......	5
10 Civil Engineering...	Stereotomy	2	Mr. Denison.......	5

SECOND SEMESTER.

Course.	Subject.	Weekly Exercises.	Instructor.	No. of Students.
4. Drawing.................	Free-hand Drawing..........................	8	Mr. Denison......	7
5. Drawing.................	Descriptive Geometry........................	8	Asst. Prof. Davis	12
6. Drawing.................	Shades, Shadows, and Perspective.....	2	Mr. Denison.......	8
7. Drawing.................	Free-hand Drawing, (advanced)..........	3	Mr. Denison.......	15
8. Drawing.................	Architectural Water-color Drawing.....	2	Mr. Denison.......	8
3. Surveying...............	Plane-table, Sextant, Earth-work.........	5	Asst. Prof. Davis	12
4. Surveying...............	Field work, 4 weeks entire....................		Asst. Prof. Davis	9
4. Civil Engineering...	Engineering Design, (advanced).........	5	Prof. Greene.......	2
7. Civil Engineering...	Applied Mechanics	1	Prof. Greene.......	18
8. Civil Engineering ..	Theory of Construction, Continued.....	4	Prof. Greene.......	2
9. Civil Engineering...	Hydraulics, Water-supply, Sewerage...	1	Prof. Greene.......	8
10. Civil Engineering...	Stereotomy	2	Mr Denison.......	4

The graduates from this department in the past have filled satisfactorily many responsible positions, a fact that speaks well for their theoretical and practical training. During the last year the opportunities afforded the undergraduates for acquiring familiarity with actual field operations, as distinguished from the problems and exercises for practice which have also been given, have been better than in the years before. Most of the students have participated, upon Saturdays and holidays, in the land surveying in this vicinity, and in the location and construction of the Toledo, Ann Arbor, and North-Eastern Railroad, and, in vacations, four of the undergraduates were regularly attached to section parties on the above railroad.

The month of June has usually been devoted by the class in Surveying to a practice-survey of a railroad line, under the immediate supervision of Professor Davis. As the last class had already spent a week in making a change of some three miles in the location of the T., A. A., and N. E. R. R. at Orchard Lake, it was decided, upon the suggestion of Regent S. S. Walker, to spend the four weeks of field work in making a survey of a portion of Maple river in Clinton county, to determine the practicability and method of draining the swamp above the village of Maple Rapids. This improvement was found to be feasible, and it was proposed to effect the change by removing an old dam and by deepening certain portions of the channel of the river. The swamp would thus be relieved of water for some twelve miles, many hundred acres of land would be reclaimed, and the sanitary condition of the surrounding country would be improved. The examinations made by the class extended over fifteen miles of river, including accurate surveys by transit lines, levels, soundings, and cross-sections on about three miles; a plane table survey in complete detail of forty acres at the site of the most important part of the proposed improvement and including a portion of the village; the whole accompanied by complete maps, plans, and profiles for an estimate of cost.

For a detailed statement of the instruction in the other branches taught in the department it may be sufficient to refer to the last Calendar, py. 47–49.

It is hoped that a way may be found, before long, to afford facilities for the experimental determination of the strength of building materials and for the verification of text-book statements in regard to the action of the parts and joints of frames, the flow of water, etc. A remodelling of the draughting rooms, so as to improve the lighting, by skylights or otherwise, is also considered desirable.

CHARLES E. GREENE.

VIII.—FROM THE PROFESSOR OF ENGLISH LITERATURE.

I hereby submit to you my report respecting the work in English Language and Literature during the year just ended.

Courses One and Seven. English Grammar and Speeches. Conducted by Mr. Demmon. These Courses are identical, and one of them is required of all students for graduation. During the past year one hundred and forty-six students took this work. The classes completed Abbott's "How to Write Clearly," and the chapters in "How to Parse" that treat of Difficulties and Irregularities of Modern English. Two original speeches were required of each student. The manuscripts, nearly three hundred in number, were all carefully criticised by the instructor and returned to the student to be rewritten, if necessary, and to be committed to memory and spoken before the class. There is great need among our students for this sort of training. Further practice in writing and a more thorough course in reading and speaking than we are now able to give, are urgent needs of this department of the University.

Courses Two and Eight. Rhetoric: Theory and Practice. Conducted by Mr. Demmon. These Courses are also identical, and one of them is required for graduation in all Courses except the Civil Engineering. Seventy-one students took this work during the year. Hill's "Science of Rhetoric" was used as a text-book. Each student was required to present two essays. The instructor criticised these essays in manuscript, and, afterwards, orally in the presence of the class. In many cases private criticism was also given.

In estimating the work of the instructor in the above four Courses, the correction of four hundred and thirty-four manuscripts during the year should not be overlooked. This work is of a peculiarly trying and exhaustive kind and brings little or no self-improvement to the instructor. Nothing but the feeling that it is an important service to the student, could ever induce any competent person to undergo the drudgery connected with it.

Course Three. Extemporaneous Speaking. This Course was discontinued at the opening of the year on account of the pressure of work in other Courses.

Courses Four and Nine. English Literature: Periods of Anglo-Saxon and Transitional English. Conducted by Mr. Demmon. Nineteen students elected Course Four, and twenty, Course Nine. In the former Course, Sweet's "Anglo-Saxon Reader" was used for selections, and Corson's "Hand-book" in the latter Course. For the literary history of the period, Morley and Tyler's "Manual of English Literature" was used in both Courses. These Courses, forming a continuous study of our language and literature from Alfred to Chaucer, were taken in the main by the same students and were pursued with unabated interest.

Courses Five and Ten. English Literature: Period of Modern English. Conducted by Mr. Tyler. It was necessary this year to make these two Courses identical; but hereafter they will cover different periods, as is indicated in the Calendar. Course Five will be devoted to the period of Early Modern English, that is, from the middle of the fourteenth century to the middle of the sixteenth; and Course Ten will be devoted to the period of Modern English, that is, from the middle of the sixteenth century to the present time. The two courses were elected by sixty-seven students.

Course Six. English Literature: Study of Masterpieces. Conducted by Mr. Tyler. This Course was elected by forty-five students. The method of work and the ground traversed, were the same as described in my last report.

Course Eleven. English Literature: Study of Shakespeare. Conducted by Mr. Tyler. This Course was elected by twenty-nine students. It was fully described in my last report.

Course Fourteen. English Literature: History of the Drama. Conducted by Mr. Tyler. This Course consisted entirely of lectures, delivered at the rate of one each week throughout the second semester. The Course is intended to be auxiliary to the work done in the study of Shakespeare. It was elected by forty-nine students.

The need of an *Instructor in Elocution*, who should take charge of the work of the first year in Speeches and of the Course in Extemporaneous Speaking, has been felt for some time. The large increase during the past two years in the number of students electing work in English, renders such an addition to our teaching force well-nigh indispensable to our success in this department.

M. C. TYLER.

IX.—FROM THE PROFESSOR OF MINERALOGY AND ECONOMIC GEOLOGY.

In compliance with the request of the Board of Regents, I beg leave to submit the following report of the work done in Mineralogy and Economic Geology for the academic year 1879-80.

As my leave of absence did not expire until the middle of February the work in these branches has been confined to the second semester. In Mineralogy 1, there was a class of ten persons, which, for a considerable part of the time, was divided into two sections of five each, each section attending instruction twice a week, two hours each time. In Mineralogy 2, there was a class of four persons, two of them being graduates of the School of Pharmacy. This class had a daily exercise, two hours each day, excepting Tuesdays, when the second hour had to be omitted. In both classes the instruction consisted of lectures, followed by the practical determination of specimens placed in the hands of the students for examination. In Mineralogy 3, one student pursued a special course for a part of a semester.

In Economic Geology (Geology 8) there was a class of three persons. In this Course attendance was required two days a week and two hours each day. The instruction was given by lectures, in connection with collateral reading in the library; it was not confined to Economic Geology exclusively, but was made to include also the elements of a course in Mining Engineering. This method of instruction was chosen because it seemed to be the best that could be adopted in justice to those students who had already made considerable progress in the studies required for the degree of Mining Engineer at the time when the School of Mines was discontinued.

In Geology 9, three students began the special study of the Geology of the United States, but the number was reduced to one in the latter part of the semester. I met the class for two hours on one day in each week.

For a large part of the semester I have been obliged to spend twenty-seven hours a week in the class-room.

W. H. PETTEE.

X.—FROM THE PROFESSOR OF CHEMISTRY.

I have the honor to submit the following report of work done in the department of General Chemistry.

Owing to the fact that students from every Department of the University, with the possible exception of the Law School, study General Chemistry, and that the record of the number in attendance is kept by the Deans of the respective Faculties, I am unable t state exactly the size of the classes, but of professional students th aggregate will be not far from five hundred and twenty-five.

In the Literary Department five elective Courses are given, an the whole number of students in attendance upon these is one hundre and eight.

In the report last year the hope was expressed that it might b possible to inaugurate a new method of instruction, which promise to be a desired advance on the plan hitherto pursued. By the consen and aid of the Regents this has been done, and the experience of thi year shows that it has proved to be almost a "new departure" in th means of teaching this subject. The object of the plan was to give t udents methods of experimentally verifying the general theorems of e science, which, when learned from books only, are rarely apprehended with sufficient force and distinctness. A room in the chemical boratory building fitted with desks and tables was accordingly signed to the department, and was put in the immediate charge of e assistant in General Chemistry, Dr. Joy. Written circulars, issued aily, gave directions for the experimental performance of certain rocesses, which the student was required to follow; these processes ere so chosen that they illustrated and embodied some one of the eneral theorems of the science, but the conclusions to be reached ere not stated in the circulars, but were left to the independent ought of the student aided by references to books in the library. hus each day's work took on somewhat the guise of a problem which uld not be answered merely by a reliance on memory.

The success of the plan has been gratifying. All the tables in the om were at once taken, and the interest shown in the work has been om the first all that could be wished. I desire to urge strongly that e facilities in this direction for the coming year may be much tended. It is believed that with the exception of Cornell University this method of instruction is peculiar to the University of ichigan.

JOHN W. LANGLEY.

I.—*FROM THE PROFESSOR OF ASTRONOMY AND DIRECTOR OF THE OBSERVATORY.*

I have the honor to report that the educational work of this epartment for the college year has been as follows:

FIRST SEMESTER.

urse 1	Theoretical Astronomy	3 Students	5 recitations a week
urse 5	Meteorology	8 Students	2 lectures a week
tals ...		11 Students	7 exercises a week

SECOND SEMESTER.

urse 2	General Astronomy	19 Students	8 recitations a week
urse 3	Spherical and Practical Astronomy	10 Students	2 recitations a week
urse 4	Theoretical Astronomy	3 Students	5 recitations a week
urse 6	Advanced Astronomy	9 Students	3 recitations a week
tals ..		41 Students	13 recitations a week

The instruments for educational purposes are expected from Washgton, and will probably be ready for use in the second semester of e ensuing year.

The work of this department includes also the care and use of the astronomical instruments pertaining to the Observatory. They have been in use in favorable weather throughout the year.

On the 1st of January, 1881, I desire to make a special report to the Regents on this branch of our work.

M. W. HARRINGTON.

XII.—FROM THE PROFESSOR OF ZOOLOGY.

During the first semester I offered two Full Courses. The first was a Course in Systematic Zoology, and was elected by fifty-six students. In this Course I go over the field of classification of animals in a general way, illustrating the lectures by specimens from the museum. It is planned for those students who intend to make no further study of the subject, but who wish to gain some knowledge of Zoology before leaving the University. A course of this kind, imparting a general knowledge of all animals, seems to me better fitted for the needs of this class of students than a special course giving more exact knowledge of some particular group. The Course also serves as an introduction to the higher works in Zoology for those who wish to continue the study.

Course 2.—The special study of Invertebrate Animals is not a popular course, but there are always a few, usually those who expect to each, who demand a course of this kind.

Course 3.—A course in Comparative Anatomy and Physiology was given for the first time during the past year. It was elected by forty students.

I considered a certain amount of microscopic work necessary for this Course, and was able to secure the use of the Physiological Laboratory in the medical department for this purpose. Ten lessons were given by Dr. Stowell on Vertebrate History, and five by Mr. De Tarr in the Microscopical Study of Invertebrates. I found this work of great value and interest to the class, and think there should be some permanent arrangement by which the use of the microscopes in the Physiological Laboratory can be secured for the use of literary students in Zoology, or that a nucleus of a Microscopical Laboratory be formed in connection with the department of Zoology. There is certainly as much need, in the nature of things, for the use of the microscope in zoological as in botanical study.

Course 4.—A study of Vertebrate Animals with identification of species. This Course was elected by thirteen students. The subject was studied by lectures, illustrated by specimens from the museum, and collections of tropical and foreign forms, while the vertebrate animals of Michigan and the North-west were made a special subject of study, and some one hundred and fifty species identified by each student from skins in the possession of the University, and from collections made by the students.

In addition to the regular work, several lessons were given in the microscopic study of tissues.

I also gave five lessons in Taxidermy to the class, though not a part of the regular work. This Course is one of the most satisfactory and useful that I have to offer.

Course 5, Entomology, was offered by Mr. Higley, the assistant in the Museum. Mr. Higley did much work in the study of insects, and gave excellent satisfaction in his teaching of the subject. Ten students elected the Course.

Course 6 was a continuation of Course 2 in the special study of Invertebrate Animals, and was given at the request of a few advanced students in Zoology. The Course consisted entirely of Laboratory work.

SCHEDULE OF WORK DONE IN ZOOLOGY FOR THE YEAR 1879–80.

Subjects.	No. of Course.	No. of Students electing each Course.	Hours of work of Students a week in each Course.	Hours of work in teaching and preparation of the Professor in charge.	Remarks.
Systematic Zoology by Lectures.	1	56	5		Courses 1 and 2 were given in the first semester. Courses 3, 4, 5 and 6 were given in the second semester.
Study of Invertebrates. Laboratory work.	2	4	10	25	
Lectures in Comparative Anatomy and Physiology.	3	40	6	30	15 lessons in Microscopic Histology were given with this Course.
Study of Vertebrates. Lectures and Laboratory work.	4	13	10	10	5 lessons in Microscopic Study of Tissues were given with this Course.
Study of Invertebrates. Laboratory work.	6	3	10	—	
Entomology. Laboratory work.	5	10	10	20	Taught by Mr. Higley the assistant in the Museum.

Whole number of students electing Zoology in first semester.................................... 60
Whole number of students electing Zoology in second semester................................... 66
Number of hours a week spent by the Professor in charge during first semester.......... 25
Number of hours a week spent by the Professor in charge during second semester.... 40
Number of hours a week spent by Mr. Higley during second semester........................ 20

The needs of the department of Zoology, as they appear to me, are the following:

First, an assistant, competent to do part of the teaching and to assist in identifying and arranging the collections for the New Museum.

Second, either microscopes which shall be the property of the department, or the use, when needed, of those belonging to the Physiological Laboratory.

Third, a room specially devoted to Zoology, so that the labor of removing and replacing specimens for illustration may be lessened, and that suitable black-boards and charts may be used. The room now used serves for three Professors teaching three distinct subjects.

Fourth, a set of cases and drawers for the preservation and display of a series of specimens to be used in teaching, as the removal of the collections to the New Museum will necessitate the keeping of a set for this purpose in the old building.

J. B. STEERE.

XIII.—FROM THE PROFESSOR OF MODERN LANGUAGES.

There were four Courses of instruction offered in French for the first semester. In Course 1, seventy-six students were instructed in three sections, two by Mr. de Pont, one by Mr. Hennequin. These students were beginning French, and the work was entirely elementary; the text-books used were Duffet's grammar, with Hennequin's French Verbs and Reading-lessons. Course 2, Idiomatic Analysis and Composition, was taken by seventy-five students, instructed in two sections by Mr. de Pont and Mr. Hennequin. The members of these classes practised in the use of the most frequently recurring idioms in French and read, one section, Gerusez' Abrégé, the other, Corneille's Cid. Course 3, in the Classic Drama, was taken by twenty-five students, who read, under Professor Morris, a play each of Racine and Corneille, and two of Molière. Course 4, in the Romantic Drama, was elected by nine students, who read, under Professor Morris, three plays and a romance by Victor Hugo.

Four Courses of instruction in French were also offered during the second semester. In Course 5, a continuation of Course 1, sixty students were instructed in three sections by Mr. de Pont and Mr. Hennequin. The study of the grammar was continued and about two hundred pages of French prose were read. Course 6 was elected by fifty-four students. instructed in two sections by Mr. de Pont and Mr. Hennequin. About two hundred pages were read and analyzed by the classes, the selections being from Boileau, Voltaire, etc., and essays in French were written and corrected. Course 7 was elected by twelve students, who read under my instruction about two hundred pages of sixteenth century French. Course 8 was taken by twenty-six students, who read under Mr. Hennequin two plays and two romances by modern authors, Victor Hugo, Dumas, etc.

Two Courses in German were offered for the first semester. German was begun by one hundred and twenty students, in four sections, two taught by Mr. Hennequin, two by Mr. Thomas. Whitney's grammar was completed, and about thirty pages of the Reader were translated in class. Course 2 was pursued by sixty-seven students, in two sections, under Professor Morris and Mr. Thomas. Gœthe's Iphigenie and Hermann and Dorothea, and the larger part of Grossmann's Poesie were read. Four Courses in German were offered for the second semester. Course 3, a continuation of Course 1, was pursued by one hundred and four students, in four sections, one section taught by Mr. Hennequin and three by Mr. Thomas. Plays by Schiller and Lessing, and modern comedies were read, and the grammar was reviewed. Course 4 was pursued by thirty-six students, who read under me the larger part of Lessing's Laokoon. Course 5 was elected by thirteen, who read under me the most of a history of German literature in German. Course 6 was pursued by forty-five students, who read under Mr. Thomas the first part of Gœthe's Faust.

A class in Italian, consisting of thirty-eight students, completed under my instruction about half the grammar and read about twenty-five pages in the Reader. It would be highly desirable in my judgment to provide means by which greater facilities could be offered for the study of Italian and Spanish. No earnest student of literature can afford to be ignorant of the languages of Dante and Cervantes.

I also gave instruction in Gothic to one student, and one chapter in Ulfilas' translation of John was read. Mr. Thomas, also, has endeavored to supply a deficiency in the University work by giving a course in Sanskrit to a class of seven in the first semester, and three in the second.

The department has been in a very prosperous condition throughout the year, the chief difficulty being the great size of the classes. Instruction cannot be so efficient where thirty-five or forty students have to be taught in the same class, and only the skill and enthusiasm of my assistants have prevented this from being a very serious drawback.

EDWARD L. WALTER.

XIV.—FROM THE PROFESSOR OF GEOLOGY AND PALÆONTOLOGY.

Recalled to the duties of a Professor in the University, after an absence of six years, I entered upon my work with zeal and confidence. Six years had furnished me opportunity for observation and study in the universities and museums of Europe, and I resumed with zest and delight my relations with Faculties and students in the University to which I have now devoted twenty of the best years of my life. The renewal of this relation, however, was effected after the students had made their elections for the year; and this circumstance, I have no doubt, limited the number of applications for the entirely optional Courses which I was enabled to offer in September last.

Experience and observation having convinced me that students pursuing studies from free choice, may fairly be assumed to possess sufficient zeal and appreciation to prompt them to faithful duty, I determined, as heretofore, to reduce my instruction to the form of familiar lectures, and thus devote the hour spent with the class to the impartation of positive information rather than to quiz or drill. This method I felt to be further sanctioned by the comparative maturity of students who feel moved to elect from the class of studies to which general geology and palæontology belong. With younger students, and in all subjects compulsorily pursued, there must be many needing the stimulus of a daily quiz; but it is certain that the time spent in quizzing for the benefit of such, is comparatively lost to students of the requisite aptitude and of adequate industry. In any event, experience has shown that the method pursued is the way to success.

Course 1, organized with these views, was intended to be the leading or principal course in the elements of general geology. It was offered to students without special preparation in geology. It proceeded systematically, according to a didactic method, over the successive chapters of terrestrial history, so far as they lie within the domain of observation and inductive science. Pauses were made at appropriate stages of the Course, to offer elementary instruction in lithological, stratigraphical, and chemical geology, and in the general structure and affinities of the various types of animals and plants which play important roles in the history of organization.

As an aid to the student in reviewing the discussions of the class-room, and in attaining to a systematized intellectual grasp of the whole subject, I prepared and published an Analytical Syllabus of the science of geology, containing references to sources of information. The references under each sub-division lead the student, first, to two or three standard text-books, and then to other well known and accessible works, and finally, in many cases, to the less accessible original authorities. It is thus intended to be of use not alone to the student of the elements, but also to the more advanced student and the investigator. This Course occupied two hours a week in the class-room, and was elected by thirty-four students.

Supplementary to Course 1 was Course 2, the aim of which was threefold: 1. To review the subject presented in the other Course, stating principles in new language and different lights, offering opportunity for conversation and discussion, and often extending the instruction to collateral themes which, in the regular lectures, had to be omitted. 2. The introduction of a limited quiz, intended less to test the knowledge of individual students than to indicate the points regarded of first importance. 3. To afford an opportunity of review for students who had already taken one or more Courses in geology, but who felt that their acquirements needed greater precision and clearness. Experience showed that this Course was gladly sought, and was peculiarly suited to meet the necessities of students. It occupied one hour a week in the class-room, and had an attendance of thirty-three.

Course 3 was devoted to elementary palæontology. The generalities of palæontology were, indeed, presented in Course 1. In this Course it was proposed to discuss more attentively the principal types of extinct life, and show their relations to the world of actual life. Eozoon, corals, crinoids, trilobites, chambered shells, brachiopods, reptiles, and mammals, were taken up in succession; and finally, several lectures were presented, in which I endeavored to explain the wider relations of the numerous facts to each other and to the progress of life and of the world. These generalizations laid a broad scientific foundation of facts and doctrines on which to build, in the second semester, some theories which stand yet, somewhat undefined, in the dim light of speculation. This occupied two hours a week in the class-room, and was elected by seven students.

I provided further a Course in advanced palæontology, designated Course 4. It was intended for students already acquainted with the elements of geology and palæontology, and was confined to thorough investigation in a limited field. The subject taken up was *Stromatoporidæ*, accessory to which was a full study of *Eozoon*, the oldest known animal form. The subject was prosecuted by the aid of numerous actual specimens, microscopic sections, and all accessible literature. The student was required both to describe and to depict every feature of interest, whether in the full-sized specimen or in microscopic sections. This Course occupied the student ten hours a week, five of which were in the presence of his instructor. There was only one election of this exacting Course; but I shall always seize the opportunity to give direction to the most advanced study, even if no more than one student develops the aspiration for it, and feels willing to undergo the requisite toil.

In the second semester, Course 5 was a continuation of the subject of elementary geology; but it was devoted to theories, as the first Course was strictly confined to facts and doctrines. I desired to keep the theories of the science apart from the positive data and settled principles, in order that the student might be saved from the somewhat popular error of conceiving geological science as a mere bundle of changing and unsubstantial speculations. This Course afforded the opportunity to discuss the internal condition of the earth, cosmogony, comparative geology, mountain-making, the question of evolution, and the pre-historic condition and antiquity of mankind. The Course could only be taken by such as had already acquired the elements of geology and palæontology. The student's work was aided by Part II. of the Analytical Syllabus, with references to sources of information. The two portions of the Syllabus cover 115 octavo pages, and contain not less than 6,000 references. This Course occupied one hour a week, and was elected by twenty-nine students.

Course 6, like Course 2 of the first semester, was intended for examination, review, amplification, and mutual discussion. The subjects, so full of living interest and suggestion, were taken up by the students with eagerness, and often with unexpected discernment and good judgment. The Course was one hour weekly, and was taken by twenty-three students.

Course 7, like Course 4, was a continuation of advanced palæontology. The special subject was brachiopods. These forms were studied in the anatomical structure both of the shell and of the soft parts, their classification, their geological history, and their special relations to American geology. Two students prosecuted the study of microscopic structure to a considerable extent, and made and recorded observations which were really new to science. Many microscopic drawings were made, illustrating, in some cases, points not hitherto shown in any published works. The Course was elected by three students, who were required to devote to it ten hours a week, five of which were in the presence of the instructor.

The chair of general geology and palæontology covers ground from which grow some of the most fruitful applications of science, and some of the most momentous questions in scientific philosophy. I feel, therefore, a profound interest in giving it a respectable and authoritative standing among the other important chairs of the University. I not only hope to offer the most effective facilities for the dissemination of elementary ideas; but I believe the best interests of my chair and of the University in its present stage of development require very especial efforts to foster the spirit of advanced scholarship. If such is also the view of the authorities, I shall co-operate with them zealously and untiringly.

ALEXANDER WINCHELL.

XV.—FROM THE PROFESSOR OF THE SCIENCE AND THE ART OF TEACHING.

I respectfully submit the following report of my work during the current year.

The greater part of my time has been spent in the organization of my Courses, in doing preliminary and preparatory work.

During the first semester, the purpose of my lectures was to teach the art of organizing, governing, and supervising public schools, and to discuss the general principles of school management.

During the second semester, it was my aim to teach the principles that underlie the art of instructing and governing, and to discuss methods and systems of education.

During the first semester, I lectured twice a week, on Tuesdays and Thursdays; and during the last half of the second semester, I had five exercises a week, four on Tuesdays and one on Thursdays.

The attendance on my Courses was as follows:

Whole number of pupils in Course I	36
Whole number of pupils in Course II	78
Total in both Courses	114

WILLIAM H. PAYNE.

XVI.—FROM THE ACTING PROFESSOR OF PHYSICS.

The following report on the work done in the department of Physics during the year 1879-80 is respectfully submitted.

During the year eight Courses were offered, four in each semester. In the first semester the experimental lectures and recitations were continued as heretofore. The number of students completing the work in the several Courses was as follows:

Two lectures and one recitation a week	47
Two lectures and three recitations a week	43
Total	90

In addition two new Courses, numbered 7 and 8, were offered. As the few students electing the former of these—Theoretical Physics—were not prepared for a mathematical course, special reading in the library was assigned them, and one hour a week was spent with them in reviewing the work. Course 8 in Physical Problems was completed by nine students. To this work one hour a week was given.

During the second semester the courses in the Physical Laboratory, 3 and 4, were taken by fourteen students, seven of whom spent at least two hours, five days a week; the other seven, two hours, three days a week; of these, three were doing advanced work. Two or three others have done considerable work, but have not yet taken their examinations. The short course in Advanced Acoustics was withdrawn as it was elected by very few students. The Teachers' Course was given as heretofore.

The time devoted to the work of the department during the first semester was: For lectures, four hours a week; for recitations, ten hours; for the preparation of lecture-experiments, four or five hours. During the second semester I directed the work in the Physical Laboratory three hours daily, and gave about ten lectures to the Teachers' class.

The research begun by a post-graduate student during the preceding year on the "Friction of Fluids" was continued with improved apparatus of his own devising and construction, and the results were embodied in a thesis presented for the degree of Ph. D., which he received at the last commencement.

Every year since the opening of the laboratory there have been advanced students in attendance on the work, both undergraduates and post-graduates. To meet the needs of such students, and to bring our equipment to the point where a comparison with several institutions in the Eastern States will not be to our disadvantage, a liberal increase in the supply of instruments for refined measurement and exact research, as well as of books of reference, is urgently needed. A good beginning has been made, and each year there has been some increase in the supply of apparatus, but very much more remains to be done. It is the earnest hope of all who are familiar with the work and needs of this department, that the much-needed increase may come soon. CHARLES K. WEAD.

XVII.—FROM THE ASSISTANT PROFESSOR OF BOTANY.

I present the following report of work done in the department of Botany during the Academic year 1879-80.

Instruction in Botany was given in five different Courses as follows:

1. A Course in Systematic Botany, consisting of daily recitations, lectures, and analyses, continuing from the spring recess to the end of the year. In this Course the leading facts of plant morphology as exhibited in the higher phanerogams are presented; and, by numer-

ous and repeated exercises with living specimens in hand, the student is taught to describe accurately and to analyze indigenous flowering plants. This Course, given by myself, was pursued by a class of fifty, chiefly pharmacy students, with several from the literary and medical departments.

2. A Course in Structural Botany. The study of the microscopical structure of plants and the history of the development and reproduction of typical species, was pursued by a class of twenty-four during the whole of the second semester. The class-room work was under my own charge and consisted of two lectures and recitations each week. The practical work was under the charge of Mrs. Stowell, the Microscopical Laboratory being open for this work from 8:15 to 12:30 daily.

3. A Course for advanced students in Botany, designed for those who wish to pursue special investigations, occupying three fifths of the second semester and pursued last year by four students. This class was under my own charge, three afternoons each week being devoted to practical work in the herbarium.

4. A Course in Cryptogamic Botany, extending through the first semester, in which the study of fungi occupies most of the time, was elected by eight students. I met the class for lectures twice a week and worked with them in the microscopical laboratory from 2 to 5 P. M. daily. A very creditable amount of original work in the way of investigation of injurious species of fungi was performed by the members of this class.

5. A Course in Pharmaceutical Botany, also occupying the whole of the first semester. This Course is taken by the senior pharmacy class, but is also elected by students in the literary department, and was pursued last year by a class of thirty-two. Mrs. Stowell had charge of the practical work and gave instruction in the Laboratory from 8:15 to 12:30 each day, besides delivering a lecture before the class once each week. In addition to this I met them twice a week in the class-room for recitations.

In addition to the Courses above described it is proposed to offer a Course for the study of the principles of Forestry, as soon as practicable, probably in the second semester of the present year.

Work in the herbarium has been carried on by Miss Allmendinger during the past year with the same industry and accuracy that have always been characteristic of her work. The labor of mounting and arranging the specimens has been carried so far that it can now be substantially completed the present year if suitable help is provided. The botanical collection has been increased by the presentation of numerous specimens collected by Dr. J. B. Steere in Brazil, by a large and valuable collection of fungi secured by Professor M. W. Harrington as exchanges, and by the addition of various donations from other sources.

The Microscopical Laboratory is now well equipped for all ordinary work in Structural and Pharmaceutical Botany.

There is, however, an imperative need of a few better objectives than have yet been furnished us. One of our post-graduate students having undertaken the study of fermentation and putrefaction, it becomes absolutely necessary to provide him with a suitable immersion objective. It is hoped that an amount not to exceed one hundred dollars may be appropriated for this purpose by the Board of Regents at their next meeting.

I append a tabular statement of Courses, number of students pursuing them, and hours a week spent by the instructors in the classroom and Microscopical Laboratory.

FIRST SEMESTER.

Course.	No. of Students.	Hours a week.	
		V. M. Spalding.	Mrs. Stowell.
1. Cryptogamic Botany..................	8	16	
2. Pharmacology and Structural Botany..............................	32	2	20

SECOND SEMESTER.

Course.	No. of Students.	Hours a week.	
		V. M. Spalding.	Mrs. Stowell.
3. Structural Botany......................	24	2	
4. Special Botanical Investigation	4	9	
5. Systematic Botany....................	50	5 after spring recess	20

V. M. SPALDING.

II.

FROM THE DEAN OF THE DEPARTMENT OF MEDICINE AND SURGERY.

In compliance with your request, I have the honor to make the following statementsrespecting the work done in, and the needs of, the Department of Medicine and Surgery.

The attendance during the past year has been greater than that of the preceding, notwithstanding the lengthening of the term to the full college year, and the requirement of an additional year of college work, or the attendance at the college of three years of nine months each. During the year the usual amount of didactic instruction has been given, and the amount of teaching and labor in the Hospital and Clinical Amphitheatre has greatly increased.

The work in the various Laboratories—Chemical, Anatomical and Physiological—has been vigorously pursued, and all the members of the teaching corps have been present and faithful in the discharge of their duties.

Besides the labor performed in the Department of Medicine and Surgery, several of the Faculty have given instruction in the Dental College, delivering special though short courses of lectures adapted to the wants of the students in that Department.

The increase of the number of students in our own Department, and the presence of students from other Departments at our lectures have greatly embarrassed the Faculty, and seriously incommoded the students by want of sufficient seats in the lecture rooms, and several of our students who matriculated have left because they were unable to procure proper places.

The division of the class which we are now endeavoring to effect will diminish, it is hoped, the crowding in the lecture rooms, but will greatly increase the labor of the Faculty—so much so that, without increase of assistance, full justice cannot be done to students, especially while so many not belonging to our classes are crowded into our rooms.

The repeated presentation of claims for increased expenditure is by no means agreeable to the Faculty, and may be annoying to the Regents; but the continued expansion of the science and the art which we teach, and the increased number of students seeking our instruction, present increased needs which are imperative, and force us to request that while the number of students now taught continues an increase of assistance be afforded. Our lecturing force may perhaps be sufficient, but we need more aid in questioning or drilling on the subjects of the lectures, and in text-book drill.

In most of the large schools in New York and elsewhere, special instruction is given outside of the Faculties, for which additional, and in some cases, large fees are charged. As but few students are able to pay these fees a large majority of the students do not secure this kind of teaching. To encourage or even allow this system of charging is contrary to our policy and our profession. We promise a complete medical education, at a low rate of fees, demanding time, talent, and knowledge, rather than money, and we are convinced of the importance of more personal drill and recitation from books; this cannot be had with bodies of several hundred together. It requires division into sections of moderate numbers; and this work it is impossible for the Professors to do, with the number of lectures they have to give, and to repeat to the women connected with the Department.

We feel the more confidence in calling your attention, and the attention of the Regents to this subject, as the Faculty of our sister Department of the law have found it important to employ an able and distinguished member of their profession to do for their students this kind of work.

Our Faculty are striving to make the Department of Medicine and Surgery a model of its kind, and more work in this direction is necessary for the purpose. The work needed to be done requires ability and experience such as will command compensation. The compensation need not be large, but it should be such as to secure more continued service than will be rendered by young men for the honor of having their name appear in the Calendar.

The Hospital requires most imperatively a greater number of assistants, and the same persons who render skilled assistance there might aid in teaching students. We do not see how assistance of this kind can be dispensed with; for even if relieved from instructing students in other Departments it would be impossible for members of the Faculty to perform all the work in drill and recitations required. The hospital and clinical work has so largely increased, that those engaged in teaching the practical branches are now devoting so large a share of their time to duties in the Hospital and Clinical Amphitheatre, that the work of reviewing and instructing the class in sections cannot be performed by them.

The plan to which attention has been called on former occasions, of interesting the State directly in the Hospital, making it an institution for receiving the patients from the State School at Coldwater, and from the different counties, patients afflicted with diseases which cannot be so conveniently treated outside of a hospital supplied with all the necessary appliances, and in the charge of those who devote special attention to particular diseases, has been received with much favor in different quarters; and the Faculty again express their willingness to undertake the additional responsibility and labor which an enlargement of the Hospital and the receiving of that class of patients would involve. We do not doubt it would be a matter of economy to the State, and we hope it would be the means of restoring to comparative health, and the power of self-support, some, at least, who would otherwise require the continual support of the State.

A. B. PALMER.

III.

FROM THE DEAN OF THE DEPARTMENT OF LAW.

The Faculty of Law in reporting upon the work of the last year have only to report general prosperity and satisfactory progress. Unfortunately, the health of Professor Wells failed before the beginning of the college year, and it became necessary to secure some one to take his place while his disability continued. Our former associate, Professor Charles I. Walker, LL. D., on being applied to, kindly consented to give the Department the benefit of his services, and remained with us during the year. The attendance of students was large, being in all 395, of whom 175 received the degree of Bachelor of Laws at the annual commencement in March.

The Tappan Professor gave his services through the year to those students who were not applicants for a degree. For the more thorough instruction of those students it was found necessary to divide them into two sections; but this was only because of their great number, as each section took the same studies. The special exercises have consisted in systematic instruction in the rudimentary elements of the law, taking as text-books, chiefly the Commentaries of Sir William Blackstone and Chancellor Kent. Portions of these works are regularly assigned for their study, and critical examinations are had upon them by way of recitations. These exercises, moreover, are always accompanied with such oral explanations and instruction as may seem needful to a full comprehension of the subject. As a general rule the young men appreciate the importance to their future progress and success in the profession of a thorough knowledge of the fundamental principles of the law, and as they become interested in these, devote themselves with commendable industry and zeal to acquiring a mastery of them.

The Faculty of Law deem it their duty to press upon the attention of the Regents, at this time more than ever before, their special wants and necessities. It is well known to you, as it is to others connected with the University, that two important interests have long suffered from comparative neglect when University funds were being appropriated. One of these is the University Library, which has now for some fifteen years been imperfectly accommodated with what was intended to be, and should have been, only temporary quarters, in the Law Building. No one better than yourself can explain to the Regents how inconvenient this has been, but they can easily see for themselves if they will visit the room at almost any time during the college year. As the number of students who are pursuing post-graduate courses increases, the inconvenience is felt much more severely, and it will be greater and greater every year.

The other interest is that of the Law Department. If the University Library were removed from our building, we should have not a foot of space in it which would not be needed for our purposes. Instruction suffers now for want of room, and it is quite impossible to subdivide our classes for examinations, as they need to be subdivided. The present Law Library room is also wholly inadequate.

The Faculty of Law have witnessed with pleasure and without a murmur the additional accommodations which from year to year have been provided for the Medical Schools, and the School of Pharmacy, and rejoice in those schools being able, by the aid thereof, to do full justice to all who come for instruction therein. They have not been disposed to push their own wants to the detriment of the schools named, or indeed to the detriment of any other school, or of any general interest. When the University has had means, their invariable desire has been that they should be so expended as best to subserve the common interest. Their disposition in this regard has probably led to their own needs being sometimes overlooked, and discriminated against, and this has seemed especially plain to them during the last two or three years.

The great and paramount need of the University at this time, in our opinion, is better accommodations for the University Library. For this purpose a building specially designed for the Library is required. Its erection would accommodate and advantage every professor and every student in every school of the University, and would enable the library to be protected and increased. But its erection would accommodate the Law School specially, because it would give to it the room it imperatively needs, and which of right belongs to it. It cannot be just that this Department should any longer give up half the available space in its building for the accommodation of all the other schools, when it has not a foot to spare, and is suffering for the want of the whole building for its exclusive use.

The Faculty most respectfully request that you urge this great need upon the attention of the Regents. You can remind them at the same time of a fact to which we have already called their attention, that within our present limited quarters we can neither increase the number of our books, nor protect those we already have.

T. M. COOLEY.

IV.

FROM THE DEAN OF THE SCHOOL OF PHARMACY.

The number of students in the School of Pharmacy during the past collegiate year has been eighty-one; comprising forty-seven in the work of the first year, thirty-four in that of the second year, and one graduate. The number completing the requirements and receiving the degree was twenty-three. For the past six years, the average annual number of students has been seventy-two, and the average annual number of graduates has been twenty-four.

An advance in the requirements for matriculation, declared in December, 1878, has just now taken effect, for the entering class of the next collegiate year. One purpose in the adoption of this advance was to check an increase in numbers, an end which has been barely accomplished, as appears from the fact that at the present date forty-nine have entered for the work of the first year. Of these, twenty-nine, or fifty-nine per cent, were admitted upon diplomas, and certificates of good standing in collegiate institutions.

Regarding the professional success of the school, good evidence appears in the station and employment of the alumni, as registered in the alumni list of the Announcement of the School for the last year. Of the two hundred and thirty graduates, not including those of the present year, sixty-seven per cent. are in the practice of pharmacy and chemistry, including manufactures. Twenty-one per cent. have entered the profession of medicine. Of the twenty-five graduates of 1879, twenty-one were engaged in the practice of pharmacy before the close of that year, and three had entered on further studies in the University. The services of our graduates are most in demand in houses where our graduates have already been engaged, and especially for the duties of the prescriptionist. Also, several of the largest manufacturing pharmacists of the country obtain chemists from this school, and there is an increasing inquiry for our graduates to serve as analysts, especially for the detection of adulterations in articles of food.

Of the last graduating class forty-six per cent. had been engaged in the practice of pharmacy before entering their college work. The remainder enter upon the vocation, in a subordinate capacity, to gain that experience obtained only in actual business, and having the good help of systematic training to enlighten the duties of apprenticeship.

The accomplishment of original work, as required for graduation, continues to be an object of earnest interest and no little labor. The thorough search of authorities and memoirs required in support of every investigation, is much more difficult to obtain of the student, than is the faithful execution of the experimental work. To bring about more completeness in the search of authorities, on the part of the students, and to train them in the use of the literature of their profession, bibliographical subjects were assigned to three members of the last class. Fair results were obtained, encouraging us to persevere. One of the theses just named, an index to the Literature of the Solanaceous Alkaloids, of one hundred manuscript pages, has already been obtained in copy for use in literary work, and it well deserves publication. Of the experimental investigations of the last graduating class, papers are being published in *The American Journal of Pharmacy*, Philadelphia; *The American Chemical Journal*, Baltimore; *The Journal of the American Chemical Society*, New York; *New Remedies*, New York; *The Physician and Surgeon*, Ann Arbor. Especially deserving of mention is a full and careful research on the "Cinchonas of Commerce," with original drawings from the microscope, to appear in the November number of the journal first above named. The subject of the assay of drugs containing alkaloids has been assigned to this school by the Committee on Revision of the Pharmacopœia. This was first undertaken in 1878, on request of a Committee of the American Pharmaceutical Association, and reports sustained by the work of four of our students were published in the proceedings of that year, (pp. 806–838). The results were embodied and extended in the volume of the American Pharmaceutical Association's report on the Pharmacopœia, in 1879, and were criticised approvingly by the English journals, and published in full in several of them. Four members of our last class carried out trials of methods within the same field, and the reports of their work are engaged to the Committee of Revision, and nearly ready to be published.

The responsibility undertaken by our school, in contributing to the stock of learning in the profession to which it belongs, is indicated by a computation lately made by a member of the class of 1876, who finds that about forty-five per cent. of all our graduates have done work reported in the chemical journals of this and other countries. The greater part of our contributions, for several years past, appear, either in full or in brief, in the pharmaceutical year-books of England and Germany. Many of these reports are of brief extent, yet they serve to give our students a constituency in the body of learning and an interest in every study. Among those of larger import, may be named a new Analysis of the *Lobelia Inflata*, by a member of the class of 1877, prepared by him for *The Pharmaceutical Journal*, of London; the discovery of a third alkaloid in Hydrastis, by a member of the class of 1873, continued by a member of the class of 1875, and published throughout; a general scheme of chemical analysis of plants by one of the class of 1876, given to *The Chemical Journal* of the Johns Hopkins University, last year, and widely republished; and analyses of waters before and after household filtration, by members of the classes of 1877 and 1879, published in *The Chemical News*, London, and in the report of the Michigan State Board of Health, for this year. A brief method for the analysis of soaps, patiently worked out in our Laboratory in 1874, and then very widely circulated in the publications, is of interest to us as being the first contribution of an alumnus of that year, who has since gained decided honors in the societies of chemistry and pharmacy abroad, now holding a responsible place in the Faculty of the official School of Pharmacy in England, where he has been active in original research. These evidences of the capability of our system of instruction, under the advantages generously afforded us by the University and the State, are presented for the encouragement of the friends of our School. Also, they attest the faithful industry and the good ability of the teaching force which the University has assigned to the studies of the School of Pharmacy.

A schedule of the chemical laboratory work of the School of Pharmacy is given, with the extent of each course and the duties of each instructor, in the accompanying report on *Applied Chemistry*. A summary of the other required studies of the school, including the number of students, the hours and duration of each study, and the extent of duty of each officer of instruction, is here appended:

	Number of Students.	Exercises* a week.	Duration of Course.
1. General Pharmacy. PROF. PRESCOTT. Lectures and Recitations. Students in first year	44	2 to 3	22 weeks
2. General Chemistry. PROF. LANGLEY. Lectures, with a class in Department of Literature, Science, and the Arts. Students of the first year	42	3	14 weeks
3. Systematic Botany. ASST. PROF. SPALDING. Recitations and Practical Studies. Students in first year	50	5	12 weeks
4. Pharmacology and Micro-Botany	32		16 weeks
Lectures. ASST. PROF. SPALDING		2	
Lectures. MRS. STOWELL		3	
Laboratory work. MRS. STOWELL		3	
5. Materia Medica. Students in second year. Lectures, with Department of Medicine and Surgery. PROF. FROTHINGHAM	32	2	20 weeks
Recitations. DR. VAUGHAN	32	2	32 weeks
6. Inorganic Pharmacy. PROF. PRESCOTT. Students of the second year. Lectures	31	3	16 weeks
7. Organic Chemistry and Pharmacy. PROF. PRESCOTT. Students of the second year. Lectures	27	5	20 weeks

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* An exercise in the laboratory requires two to three hours; recitations and lectures continue one hour.

Our School has two representatives, one from the alumni and one from the Faculty, engaged on the Committee for the Decennial Revision of "The United States Pharmacopœia," a work of much labor, for the common service of pharmacy and medicine.

We would not fail to present, through the President, to the Regents of the University, the grateful acknowledgements of every student and officer of instruction in our School, for the enlargement of the Chemical Laboratory. Though this enlargement has been more imperatively demanded for the larger numbers of the other professional departments using it, surely no branch of the University will gain more upon the score of comfort derived from the additional room, than the School of Pharmacy.

ALBERT B. PRESCOTT.

V.

FROM THE DEAN OF THE HOMŒOPATHIC MEDICAL COLLEGE.

In behalf of the Homœopathic College of the University of Michigan, I transmit herewith a synopsis of the general Educational and Clinical work done in this Department for the year ending June 30, 1880.

COURSE OF INSTRUCTION.—The *Course of Instruction* just terminated has been more satisfactory to both Faculty and students, than that of any previous session, and the number of matriculates has increased over that of any preceding year. The educational course has been more comprehensive and thorough the past session than any preceding term, owing to our recent hospital accommodations and more extended clinical facilities.

MATERIA MEDICA.—The *Chair of Materia Medica* has delivered during the term 72 lectures exclusive of repetitions, which aggregate 144 didactic lectures for the session of nine months.

THEORY AND PRACTICE.—The *Chair of Theory and Practice* has given 72 lectures and repetitions, which amount to 144 delivered during the session; these, together with the clinical work done by the same chair give an additional 72 hours. As an addendum to this chair, Professor Wilson has given 20 didactic, and has added about 40 clinical, lectures on the *Diseases of the Eye and Ear*, making a total of about 250 lectures delivered by that chair during the session.

THE CHAIR OF SURGERY.—The work of this chair has been adapted as far as possible to the Graded Course; one half of the term has been devoted to teaching the *Principles of Surgery and Minor Surgery;* the remainder to Operative Surgery, including a review of the former, making 72 first lectures, which with the seconds give the total of 144 lectures; these, with the clinical work twice a week of one and a half hours each, give a grand total of 252 clinical and didactic lectures during the term.

GYNÆCOLOGICAL AND OBSTETRIC CHAIR.—Since the appointment of Professor H. C. Allen by the Faculty to the *Chair of Diseases of Children, Obstetrical and Gynæcological Diseases*, created by the Board of Regents in March last, there have been delivered in this important branch of medicine about 30 didactic lectures, exclusive of about the same number of clinical hours devoted to the *treatment of these diseases*, making in the aggregate a total of 60 lectures clinical and didactic on these significant topics.

HOSPITAL WORK.--Since the opening of the Hospital and Amphitheatre and the consequent increase in the number of patients, the clinical staff have had their labors largely multiplied. The uniform success that has followed their ministrations, promises a rich harvest of clinical and bedside practice which will redound largely to the growth of this Department of the University.

THE THERAPEUTICS OF GYNÆCOLOGY AND OBSTETRICS.—A petition was presented to the Faculty the present session by the students of the Homœopathic College, stating that they were deprived of instruction in this interesting branch of practice, and were consequently unprepared to enter upon the active duties of their profession. The Board to whom this subject was referred promptly created a chair with the view of having this important branch properly taught. The Faculty were empowered to fill this chair, without compensation, and Dr. H. C. Allen, of Detroit, was appointed, and entered upon its important duties to the entire satisfaction of both the Faculty and students. The ability and fidelity which he brought to the work are attested partly by the summary of clinical and hospital cases treated by him since his advent to the chair. The Faculty request that the Board will make this chair a permanent one with a suitable appropriation for its maintenance hereafter.

EXAMINATIONS.—The Faculty, with the idea of giving extended publicity to the thorough teaching that has marked this Department of the University the past year, and for the purpose of reviewing the important subjects gone over during the long session of nine months, have instituted a plan of "*Examination reviews*," beginning on the 7th day of June and terminating on the 25th day of the month, by the Examining Board. The plan has proved so valuable and acceptable to the students who have participated in it, that it is proposed hereafter to begin such reviews on the first of June for the benefit of all the classes in "*the graded course.*"

THE EXAMINING BOARD.—The appointment of the Board of Examiners has produced a good effect in this, that it has separated to a certain extent the teaching and examining bodies, and has given an increased value to the Diploma of this College, so as to make it sought after by those students of medicine who prefer a thorough and systematic course of instruction. This, with the long term and the graded course, has placed this College at the very front of Homœopathic Schools in the country, and we believe that with a united and zealous Faculty, it is soon destined to become the best patronized school in the land.

I take pleasure in attesting, in behalf of the Faculty, our appreciation of the commendable manner in which the Examining Board has performed its functions, and the earnestness and ability with which it has accomplished the work allotted to it.

THE ECKEL MUSEUM.—In consideration of a long personal friendship with the occupant of the Chair of Surgery in this College, J. N. Eckel, M. D., of San Francisco, California, has generously donated $50, and a like sum to be paid annually, to maintain a Museum of Anatomical and Pathological Specimens for the sole use and benefit of the Homœopathic College.

ATTENDANCE CARDS.—In behalf of the Faculty, I request that the Board will take some action touching the importance of giving to all our class who attend the lectures in the department of Medicine and Surgery "attendance cards" showing their presence at such lectures. This is the rule in all well appointed medical schools, and the absence of it works injuriously to our students, in this, that without these cards they are deprived of privileges in the Canadian school that others possessing them enjoy. The requirements of the College of Physicians and Surgeons of Ontario, the *registration bureau* that regulates the practice of medicine and surgery in the Canadas, require these "attendance certificates" to prove the qualifications of the applicant for a license to practice his profession. Until such an arrangement is entered into in behalf of the Homœopathic College, we shall be deprived of the patronage of all such students from the Canadas who desire to become matriculates of the Homœopathic department of this University.

I trust that the Board will grant the above requests, which are presented solely for the best interests and future welfare of this College.

E. C. FRANKLIN.

VI.

FROM THE DEAN OF THE COLLEGE OF DENTAL SURGERY.

The class during the period embraced by this report, numbered eighty-three, thirty-four of whom were candidates for graduation.

Attendance upon two courses of instruction is required for graduation. In many instances, however, three courses are taken instead of two; thus making the work easier and the instruction more thorough.

The following curriculum has been arranged with a view to grading the classes, and to accommodate those attending two, and those attending three, years:

First Year.—Anatomy, Physiology, Dissections, General Chemistry, Prosthetic Dentistry, Physiological Laboratory (Histology).

Second Year.—Review of First Year Studies; Clinical Dentistry, Theory and Practice of Dentistry, Pathology, Materia Medica, Analytical Chemistry, Metallurgy (Special).

Third Year.—Theory and Practice of Dentistry, Clinical Dentistry, Pathology, Therapeutics, Special Surgery (Oral), Diseases of Women and Children.

At the middle of the second year the student may be admitted to an examination on Anatomy, Physiology, General Chemistry, and Prosthetic Dentistry. This, if satisfactory, will be regarded as final. Prior to this he must make two or more satisfactory practical dentures, and also at this time present for deposit a denture that shall be acceptable to the Faculty. At the end of the second year, in addition to the above, an examination shall be had upon the principles of Pathology, Materia Medica, Histology, and Analytical Chemistry. During, and at the end of, the third year, examinations shall be had upon the remaining branches of the course, and an exhibition of such tests of skill and ability as the Faculty may require.

For those who may find it necessary to complete their course in two terms, the following schedule of studies has been prepared:

First Year.—Anatomy, Physiology, Dissections, General Chemistry, Analytical Chemistry, Theory and Practice of Dentistry, Prosthetic Dentistry, Principles of Surgery, Materia Medica, Physiological Laboratory.

Second Year.—Anatomy, Physiology, Pathology, Theory and Practice of Dentistry, Clinical Dentistry, Special Surgery (Oral), Therapeutics, Diseases of Women and Children.

Under the embarrassments with which the work is surrounded, it has, as yet, not been found practicable to enter fully upon the work according to the plan. More room and additional teaching force are required.

The dental students attend almost the entire course of the regular medical instruction, embracing dissections, chemistry, and histology. In addition to this they have one lecture daily on operative or mechanical dentistry, and during about one-half of the term one lecture daily on special subjects.

The afternoon of each day is devoted to work in the clinical and mechanical branches. The work in the clinical room is under the direction of Dr. J. A. Watling, assisted by Dr. W. D. Billmeyer. The room for this work has a capacity for twenty-five students.

The Dental Laboratory is in charge of Dr. W. H. Dorrance, assistant and demonstrator, aided by Mr. G. W. Morgan and Mr. A. W. Hoyte. This room has a capacity for thirty-eight students.

During about half the term from fifteen to twenty students were distributed in the Chemical Laboratory, the Physiological Laboratory, and the dissecting rooms; during the remainder of the term more room was greatly needed. The best interests of those who apply for instruction require that this want should be supplied.

Another urgent need is the appointment of a Professor of Mechanical Dentistry, with a thoroughly competent assistant. Without such aid it is impossible to make the instruction in this branch as thorough as it ought to be.

In view of the fact that so many of the students of this Department remain after the close of the regular term, to pursue such branches as may be open to them, it is here suggested that the interest of such would be promoted if provision were made for keeping open the clinical and mechanical rooms during that period. Hitherto, the work in these rooms has ceased at the close of the regular term in March. Such provision would certainly be an inducement for a greater number to remain and at the same time would afford them greater advantages

The service of one Professor with a good assistant, would be sufficient as instructors during this time. Those who have remained hitherto have regretted that the advantages which such an arrangement would afford, were not offered.

J. TAFT.

APPENDIX D.

The Finance Committee of the Board of Regents submit a report for fifteen months to bring the financial year of the University to agree with the financial year of the State, from July 1, 1879, to September 30, 1880. Also an estimate of the probable receipts and disbursements for the year ending September 30, 1881.

RECEIPTS.

Balance on hand, July 1, 1879	$ 28,710.49	
Received from State Treasurer		
Interest on University Fund	51,451.78	
State Aid, 1-20 Mill Tax	47,250.00	
Steam Heating Apparatus	20,000.00	
Museum Building	40,000.00	
Homœopathic Hospital	6,500.00	
Homœopathic Medical College	8,000.00	
Dental College	7,000.00	
Hospital	3,000.00	
General Library	2,000.00	
Homœopathic Hospital Equipment	1,250.00	
Matron's House	1,000.00	
School of Mines Equipment	500.00	
First National Bank, Interest on Treasurer's Acct.	1,608.95	
Insurance on University Hall	904.34	
Duty refunded on Obstetrics Manikin	31.10	
Transfer from School of Mines Equipment	249.07	
Students' Fees, Laboratory Deposits, etc	76,707.93	
Total Receipts		$293,163.66

DISBURSEMENTS.

Paid Warrants for Salaries of Officers:	
Professors and Employees	$124,777.92
Paid on Vouchers:	
Contingent Expenses	72,468.70
Museum Building (special)	39,022.88
Steam Heating Apparatus (special)	19,898.01

Homœopathic Hospital (special)	6,500.00	
General Library (special)	3,850.80	
Homœopathic Medical College (special)	3,244.22	
Hospital (special)	2,849.14	
Dental College (special)	2,087.23	
Matron's House (special)	1,000.00	
Homœopathic Hospital Equipment (special)	753 81	
School of Mines Equipment (special)	250.93	
Dental College Apparatus (special)	121.26	
School of Mines	20.00	
Physiological Laboratory (special)	2.45	
Transferred from School of Mines Equipment (special)	249.07	
Total Disbursements		$277,096 42
Balance in Treasury, October 1, 1880		19,067.24
		296,163.66

A statement of the receipts and disbursements for the General Expense Account and several special funds is also appended and classified.

GENERAL FUND.

Balance on hand, July 1, 1879,	$ 12,565.44	
Received from State Treasurer:		
Interest on University Fund	51,451.78	
State Aid, 1-20 Mill Tax,	47,250.00	
Students' Fees, Laboratory Deposits, etc	76,707.93	
First National Bank Acct.—Interest on Acct	1,608.95	
Insurance Paid on University Hall	904.34	
Duty refunded on Obstetric Manikin	31.10	
Transfer from School of Mines Equipment	249.07	
Total Receipts		$190,768.61

DISBURSEMENTS.

Paid Warrants, Salaries of Officers	$105,037.17	
Paid Vouchers for Contingent Expenses	72,468.70	
Total Disbursements		$177,505.87
Balance on hand, October 1, 1880		13,262.74

The expenditures on Vouchers for Contingent Expenses are classified as follows:

Alterations and Repairs	$ 9,325.47
Fuel and Lights	6,816.66
Grounds	619.20
Postage	904.56
Insurance	2,248.25

Engineering Department	561.21	
General Library	133.07	
Law Library	604.17	
Medical Library	512.36	
Advertising Medical Department	375.90	
Advertising School of Pharmacy	214.26	
Museum and Microscopical Laboratory	1,190.85	
Chemical Laboratory	9,024.20	
Department of General Chemistry	530.86	
Department of Physics	449.68	
Physiological Laboratory	566.68	
Astronomical Observatory	1,065.83	
Printing Regents' Proceedings, Calendar, and Commencement Address	1,548.58	
Students' Fees refunded	1,629.00	
Triennial Catalogue	93.00	
Portrait, J. D. Pierce, by A. Bradish	100.00	
Obstetrics, Manikin, Geo. Tiemann & Co	155.00	
Special Claim, J. C. Watson	534.45	
Attorneys and Accountants	458.75	
Steam Heating Apparatus	4,702.90	
Hospital Amphitheatre	3,473.43	
Museum Cases, construction	5,065.53	
Carpenter Shop and Machinery	3,124.94	
Laboratory Enlargement	9,170.89	
Contingent Fund	7,299.02	
		$ 72,468.70

SPECIAL FUNDS.

Homœopathic Medical College:

Balance in Treasury, July 1, 1879	$ 3,014.71	
Received from State Treasurer	8,000.00	
Total Receipts		$ 11,014.71

DISBURSEMENTS.

Paid Warrants for Salaries	$ 6,450.00	
Paid Vouchers for Expenses	3,244.22	
Total Disbursements		$ 9,694.22
Balance in Treasury, October 1, 1880		1,320.49

DENTAL COLLEGE.

Received from State Treasurer	$ 7,000.00	
Total Receipts		$ 7,000.00

DISBURSEMENTS.

Paid Warrants for Salaries	$ 4,075.00	
Paid Vouchers for Expenses	2,087.23	
Total Disbursements		$ 6,162.23
Balance in Treasury, October 1, 1880		837.77

DENTAL COLLEGE SALARIES.

Balance in Treasury, July 1, 1879	$ 600.00
Paid Warrants for Salaries	600.00

DENTAL COLLEGE APPARATUS.

Balance in Treasury, Jnly 1, 1879	$ 121.26
Paid Vouchers for Apparatus	121.26

SCHOOL OF MINES.

Balance in Treasury, July 1, 1879		$ 1,635.75
Paid Warrants for Salaries	$ 1,615.75	
Paid Voucher for Expenses	20.00	$ 1,635.75

SCHOOL OF MINES EQUIPMENT.

Received from State Treasurer		$ 500.00
Paid Vouchers for Expense	$ 250.93	
Transferred to General Fund	249.07	$ 500.00

GENERAL LIBRARY.

Balance in Treasury, July 1, 1879	$ 1,850.80	
Received from State Treasurer	2,000.00	
Total Receipts		$ 3,850.80
Paid Vouchers for Expenses		3,850.80

HOSPITAL.

Balance in Treasury, July 1, 1879	$ 1,920.08	
Received from State Treasurer	3,000.00	
Total Receipts		$ 4,920.08
Paid Vouchers for Expenses		2,849.14
Balance in Treasury, October 1, 1880		2,070.94

MUSEUM BUILDING.

Received from State Treasurer	40,000.00
Paid Vouchers on same	39,022.88
Balance in Treasury, Oct. 1, 1880	977.12

STEAM HEATING APPARATUS.

Received from State Treasurer	20,000.00
Paid Vouchers on same	19,898.01
Balance in Treasury, October 1, 1880	101.99

HOMŒOPATHIC HOSPITAL.

Received from State Treasurer	6,500.00
Paid Vouchers on same	6,500.00

HOMŒOPATHIC HOSPITAL EQUIPMENT.

Received from State Treasurer	1,250.00
Paid Vouchers on same	753.81
Balance in Treasury, October 1, 1880	496.19

MATRON'S HOUSE.

Received from State Treasurer	1,000.00
Paid Vouchers on same	1,000.00

SALARY OF PROFESSOR OF PHYSICS.

Balance in Treasury, July 1, 1879	1,400.00
Paid Warrants for Salary	1,400.00

SALARY OF PROFESSOR OF GEOLOGY.

Balance in Treasury, July 1, 1879	1,000.00
Paid Warrants for Salary	1,000.00

EXTENDED TERM, DEPARTMENT OF MEDICINE AND SURGERY.

Balance in Treasury, July 1, 1879	2,250.00
Paid Warrants for Salaries	2,250.00

EXTENDED TERM, HOMŒOPATHIC MEDICAL COLLEGE.

Balance in Treasury, July 1, 1879	1,975.00
Paid Warrants for Salaries	1,975.00

PHYSIOLOGICAL LABORATORY.

Balance in Treasury, July 1, 1879		377.45
Paid Warrants for Salary	$ 375.00	
Paid Vouchers for Expenses	2.45	377.45

RECAPITULATION.

Bal. in Treasury, Oct. 1, 1880, in General Fund	$ 13,262.74
Bal. in Treasury, Oct. 1, 1880, Homœ. Med. Col.	1,320.49
Bal. in Treasury, Oct. 1, 1880, in Dental College,	837.77
Bal. in Treasury, Oct. 1, 1880, in Hospital	2,070.94
Bal. in Treasury, Oct. 1, 1880, in Steam Heating,	101.99
Bal. in Treasury, Oct. 1, 1880, in Mus. Building,	977.12
Bal. in Treasury, Oct. 1, 1880, Hom. Hos. Equip.	496.19
Total Balance in Treasury	19,067.24

The estimated receipts for the fiscal year ending September 30, 1881, are as follows:

Balance on hand, October 1, 1880	$ 19,067.24
For Interest on University Fund	38,500.00